VOLUME 3, NUMBER 6 JUNE 1954

Battelle Technical Review

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Market Studies and Technical Research

X-RAY CRYSTALLOGRAPHER

DALE A. VAUGHAN

"X-ray diffraction can be used much more effectively to increase our knowledge about crystalline materials," Dale A. Vaughan believes "Through its use we can gain a much better understanding of the mechanisms of corrosion and of reactions in metals, ceramics, and chemical compounds." He also points out that better correlation of metal structures with the properties of metals is available through diffraction studies. When used early in an alloy-development investigation, X-ray diffraction can speed progress by simplifying phase identification and other aspects of constitution studies.

In addition to the usual studies, Dale has employed methods for extending the usefulness of X-ray diffraction. He has used his bouncing X-rays to measure stress patterns in steel; to carry on fundamental structural studies on the hardening of synthetic jewel bearings; and to study thermal expansion and phase transformations in crystalline materials at both elevated and low temperatures. He also has developed a method of making approximate quantitative measurements of two-component alloys systems.

Through a special technique of his own devising, Dale is able to analyze microscopic inclusions in metals and other materials. On the basis of the photographic patterns resulting from examinations, he can identify such minute inclusions. The technique has been applied with considerable success at Battelle.

Dale's interest in X-ray diffraction began while he was carrying on his studies for a bachelor of science degree in physics and mathematics at The Ohio State University. After graduation in 1941, he taught briefly and became a member of the Battelle staff two years later. Since joining the Institute, Dale has spent much of his own time learning about new developments in and experimenting with possible methods of extending the usefulness of available diffraction equipment.

He is a member of the American Crystallographic Association and of Sigma Xi.

Three daughters, aged 10, 9, and 5, limit Dale's free hours considerably. He does find time for gardening, however, and for following his favorite sports.

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***Asterisks mark items that may be used in the Battelle Library only. None of the unbound materials listed below are available for interlibrary loan.**

AERONAUTICAL ENGINEERING

7385 Boost-Glide Rocket. A. M. Jackes. *Aero Digest*, v. 68, Feb. 1954, p. 34-35.

Mathematical discussion of "energy height" theory. Graphs.

7386 Flight Observations of Suction-Stabilized Boundary Layers. B. H. Carmichael. *Aeronautical Engineering Review*, v. 13, Feb. 1954, p. 36-41.

Case of a lifting airfoil in free flight. Actual variations in boundary-layer characteristic in a chordwise direction under a varying distribution of suction. Graphs. 9 ref.

7387 Design of the Transport Helicopter. David E. Postle. *Aeronautical Engineering Review*, v. 13, Mar. 1954, p. 70-79.

Design considerations and advantages for inter-city transport.

7388 An Experimental Investigation of the Influence of Strong Adverse Pressure Gradients on Turbulent Boundary Layers at Supersonic Speeds. Georg Drougge. *Aeronautical Research Institute of Sweden, Report no.* 46, 1953, 22 p. (TL526 A82r)

Influence on turbulent boundary layers, of a shock wave originating at a concave corner. Graphs, photographs, diagrams. 13 ref.

7389 Experimental Investigation of the Stress Distribution in a Plastic Model of a 35° Swept Back Wing With Multi-Web Construction. Bryan R. Noton. *Aeronautical Research Institute of Sweden, Report no.* 47, 1953, 44 p. (TL526 A82r)

Data to check proposed theories for structural analysis and behavior of multispar aircraft wings. Diagrams, graphs, tables, photographs. 17 ref.

7390 Theoretical and Experimental Investigaitons of Interference Effects of Delta Wing—Vertical Tail Combinations With Yaw. Willi Jacobs. *Aeronautical Research Institute of Sweden, Report no.* 49, 1953, 34 p. (TL526 A82r)

Experiments include force and pressure measurements with a delta wing with a 70° swept-back leading edge and three different vertical tails. Graphs, diagrams, tables. 15 ref.

7391* A Medium-Range French Airliner. James Hay Stevens. *Aeroplane*, v. 86, Feb. 5, 1954, p. 154-159.

New features of design. Photographs, drawings, table, graphs.

7392 The Use of Stator-Blade Control to Obtain Wide Range of Compressor Performance for Wind-Tunnel Applications. A. W. McCoy and M. J. Brunner. *ASME, Transactions*, v. 76, Feb. 1954, p. 233-240.

Design considerations and methods of prediction of performance of axial-flow compressors with stator-blade control. Graphs, tables. 8 ref.

7393 Designing Flush Antennas for High-Speed Aircraft. J. V. N. Granger. *Electronics*, v. 27, Mar. 1954, p. 136-140.

Recessed transmitting, receiving, direction-finding, and other navigational antennas were designed with good electrical characteristics. Diagrams, graphs. 3 ref.

7394 Effect of Diffusion Fields on the Laminar Boundary Layer. John W. Smith. *Journal of the Aeronautical Sciences*, v. 21, Mar. 1954, p. 154-162, 178.

Theory and results on problem of control and reduction of aerodynamic heating of flat plate at hypersonic speeds. Graphs. 9 ref.

7395 The Production of Aft Frames for Aircraft Gas Turbines. L. M. Limbach. *Machinery (London)*, v. 84, Feb. 5, 1954, p. 273-278.

Construction of aft frame, which holds combustion chambers; transition liners; and turbine and compressor casings in one assembled unit. Photographs, diagram.

7396 On Sound Generated Aerodynamically. II. Turbulence as a Source of Sound. M. J. Lighthill. *Royal Society, Proceedings*, v. 222, ser. A, Feb. 23, 1954, p. 1-32.

Theory is extended by taking into account statistical properties of turbulent airflows, from which sound radiated (without help of solid boundaries) is called aerodynamic noise. 15 ref.

7397 High-Temperature Problems Associated With Aircraft Hydraulic Systems. Frank C. Mittell. *SAE Preprint no.* 70, 1953, 4 p. (TL1 So13p)

Attempts to overcome heat barrier problems incidental to high speed flight. Diagrams, graphs.

7398 Adventures in Extreme Temperature Hydraulics. George R. Keller. *SAE Preprint no.* 71, 1953, 12 p. (TL1 So13p)

Problems in developing hydraulic components that will operate satisfactorily under elevated temperatures. Photographs, graphs. 2 ref.

7399 The Development of High Temperature Hydraulic Fluids. J. C. Mosteller and John A. King. *SAE Preprint no.* 73, 1953, 21 p. (TL1 So13p)

Requirements of hydraulic fluids to withstand varying conditions of aircraft flight. Tables, graphs, diagram. 6 ref.

7400 Design for Increased Reliability of Aircraft Hydraulic Systems. Leo Morse Chattler. *SAE Preprint no.* 76, 1953, 23 p. (TL1 So13p)

Various factors effecting reliability. Table, diagrams, photographs.

7400a Design and Development of Aircraft Hydraulic Components for Increased Reliability. J. W. Kelly. *SAE Preprint no.* 78, 1953, 24 p. (TL1 So13p)

Design phase, development and testing, production, installation, and service phase. Tables, diagrams, photographs.

7401 Electric Strain Gage Analysis of the SGVI Helicopter. G. A. Brewer. *Society for Experimental Stress Analysis, Proceedings*, v. 11, 1953, p. 7-18.

Includes diagrams, photographs, oscillographs, graphs, tables. 19 ref.

7402 A Flight Investigation of the Practical Problems Associated With Porous-Leading-Edge Suction. Paul A. Hunter and Harold I. Johnson. *U. S. National Advisory Com-*

Aeronautical Engineering

mittee for Aeronautics, Technical Note 3062, Feb. 1954, 42 p. (TL570 Un3t)

Effect of atmospheric dust and rain on clogging of porous leading edge; power requirements; and construction details. Photographs, graphs, diagrams, tables. 5 ref.

7403 Effects of Wing Position and Fuselage Size on the Low-Speed Static and Rolling Stability Characteristics of a Delta-Wing Model. Alex Goodman and David F. Thomas, Jr. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3063, Feb. 1954, 66 p. (TL570 Un3t)

Interference increments between various components are evaluated. Graphs, photographs, diagrams, tables. 20 ref.

7404 Present Status of Information Relative to the Prediction of Shock-Induced Boundary-Layer Separation. Roy H. Lange. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3065, Feb. 1954, 16 p. (TL570 Un3t)

Experimental results showing effects of Reynolds and Mach numbers on separation of both laminar and turbulent boundary layers compared with results obtained by available methods for predicting separation. Graphs, diagram. 23 ref.

7405 Comparison of Model and Full-Scale Spin Recoveries Obtained by Use of Rockets. Sanger M. Burk, Jr. and Frederick M. Healy. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3068, Feb. 1954, 63 p. (TL570 Un3t)

Investigates a 1/19-scale model of an unswept-wing trainer airplane, conducted in Langley 20-foot free-spinning tunnel. Determines rocket spin recovery characteristics of model for comparison with available full-scale-airplane results. Graphs, photographs, diagrams, tables. 7 ref.

7406 Study of Three-Dimensional Internal Flow Distribution Based on Measurements in a 48-Inch Radial-Inlet Centrifugal Impeller. Joseph T. Hamrick, John Mizisin, and Donald J. Michel. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3101, Feb. 1954, 64 p. (TL570 Un3t)

Results in form of relative velocity and pressure loss contours. Graphs, diagrams, photographs. 18 ref.

7407 A Simple Mechanical Analogue for Studying the Dynamic Stability of Aircraft Having Nonlinear Moment Characteristics. Thomas N. Canning. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3125, Feb. 1954, 18 p. (TL570 Un3t)

Analogy between a ball rolling over a contoured surface and a pitching and yawing aircraft is developed. Diagrams, graphs.

7408 Use of Aerodynamic Heating to Provide Thrust by Vaporization of Surface Coolants. W. E. Moeckel. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3140, Feb. 1954, 37 p. (TL570 Un3t)

Analysis of propulsive thrust and specific impulse attainable by cooling aircraft surfaces with liquefied or solidified gases having vaporization temperatures lower than equilibrium surface temperature. Graphs, table. 10 ref.

7409 Wind Tunnels. Why and Where. *Westinghouse Engineer,* v. 14, Mar. 1954, p. 66-71.

Specialization of wind tunnels and a great spread in their numbers, physical locations, sizes, air speeds, operating conditions, and functions. Photographs.

Books and Miscellaneous Publications

7410 Aerodynamic Measurements. Robert C. Dean, Jr. 271 p. 1953. Gas Turbine Laboratory, Massachusetts Institute of Technology, Cambridge. (QC161 D34a)

Error determination and treatment of data; temperature, pressure, velocity, flow direction, mass-flow, and humidity measurements; hot-wire anemometry; optical measuring techniques; fundamental principles of dynamic measurement; and a review of fluid mechanics. Includes extensive bibliography and psychrometric charts.

See also:
7768 (aircraft coating for corrosion prevention)
8039 (drag on a flat plate in slip flow)
8046 (gas flow behind shock by curved body)
8052 (aerodynamics)
8192 (petroleum in internal-combustion engineering—book)
8226 (temperature probes for supersonic speeds)
8244 (study of residual stresses)
8271 (membrane stresses)
8291 (instability of supported plates)
8304 (shear center for circular sections)
8811 (pitot tube design)
8933 (air conditioning in aircraft)

AGRICULTURE

7411 Insecticide Fertilizer Combinations. F. B. Folckemer and E. S. Loeffler. *Agricultural Chemicals,* v. 9, Feb. 1954, p. 42-44, 123, 125.

Increasing acceptance of insecticide-fertilizer mixtures is evidence that they are proving economically effective for control of insects in the soil. Practicability has been fully demonstrated, although a number of problems relating to their manufacture and storage remain to be solved. 10 ref.

7412 Use of Isotopes in Fungicidal Research. S. E. A. McCallan. *Agricultural Chemicals,* v. 9, Feb. 1954, p. 52-53, 119, 121.

Examples of studies that can be carried out on fungicides using radioactive tracers. 9 ref.

7413 Results of 1953 Fungicide Tests. II. *Agricultural Chemicals,* v. 9, Feb. 1954, p. 58-59, 61-62, 125, 127, 129.

Summary of reports on fungicide tests by 75 collaborating pathologists. Tables. (To be concluded.)

7414 Economic Feasibility of Supplemental Irrigation. D. B. Krimgold. *Agricultural Engineering,* v. 35, Jan. 1954, p. 22-27.

Method of estimating soil moisture from readily available climatic data and concept of evapotranspiration. Knowledge gained from this work can be used in estimating economic feasibility of supplemental irrigation. Tables, graph. 26 ref.

7415 Effect of Storage on Butternut Squash and Its Seeds. Arthur D. Holmes, Albert F. Spelman, and Robert T. Wetherbee. *American Dietetic Association, Journal,* v. 30, Feb. 1954, p. 138-141.

Relation between composition of Butternut squashes and their seeds at different stages of storage. Tables. 28 ref.

7416* Some Effects of Maleic Hydrazide on Internode Elongation, Cell Enlargement, and Stem Anatomy. Victor A. Greulach and John G. Haesloop. *American Journal of Botany,* v. 41, Jan. 1954, p. 44-50.

Experimental studies. Tables, micrographs. 16 ref.

7417* Chemistry and Energetics of Plant Photosynthesis. (German.) H. Holzer. *Angewandte Chemie,* v. 66, no. 3, Feb. 7, 1954, p. 65-75.

Quantum yield at photosynthesis and the 1-quantum effect discovered by O. Warburg. Diagrams, graphs, tables. 32 ref.

7418* Physiological Studies in Plant Nutrition. XVII. A General Survey of the Free Amino-Acids of Barley Leaves as Affected by Mineral Nutrition, With Special Reference to Potassium Supply. F. J. Richards and E. Berner, Jr. *Annals of Botany,* v. 18, new ser., Jan. 1954, p. 15-33.

Includes tables, diagrams. 11 ref.

7419* Symposium on Extraneous Materials in Foods and Drugs. *Association of Official Agricultural Chemists, Journal,* v. 37, Feb. 1954, p. 136-181.

Includes "Introduction", Kenton L. Harris; "Recent Advances in Extraction Technic", Maryvee G. Yakowitz; "Some Collaborative Investigations of Methods for Isolating Extraneous Material From White Flour", E. J. Kiteley; "Some Applications of Radiography to the Examination of Foods and Drugs", J. Frank Nicholson; "Identification of Insect Fragments in Cereal Products", W. H. Schoenherr; "Insect Contamina-

tion in Succulent Vegetables", T. H. McCormack; "Extraneous Materials in Spices", T. H. McCormack; "Mold and Rot in Tomato Catsup", T. H. McCormack; "An Approach to Insect Larval Identification by Structures Isolated as Fragments From Cereal Products", O. L. Kurtz; "Instruction in Microanalytical Methods", Howard R. Smith; "The Identification of Dung and Plant Fragments in Dairy Products", Dorothy B. Scott. Tables, photographs, micrographs, diagrams. 50 ref.

7420* The Use of Mitscherlich's Regression Law in the Analysis of Experiments With Fertilizers. Frederico Pimentel Gomes. *Biometrics*, v. 9, Dec. 1953, p. 498-516.

Mathematical method applicable to statistical analysis of experiments with fertilizers. Tables. 11 ref.

7421* The Use of the Triethanolamine Salt of 2,4,5-Trichlorophenoxy-Propionic Acid (Color-Set 1004) as a Stop-Drop Spray for Apples. D. V. Fisher and S. W. Porritt. *Canadian Journal of Agricultural Science*, v. 34, Jan.-Feb. 1954, p. 65-69.

Includes tables. 14 ref.

7422* Trace Element Content of Farmyard Manure. H. J. Atkinson, G. R. Giles, and J. G. Desjardins. *Canadian Journal of Agricultural Science*, v. 34, Jan.-Feb. 1954, p. 76-80.

Presence of B, Mn, Co, Cu, Zn, and Mo. Graphs, tables. 19 ref.

7423 Studies on the Mechanism of Fungicidal Action of Disodium Ethylene Bisdithiocarbamate (Nabam). R. A. Ludwig, G. D. Thorn, and D. M. Miller. *Canadian Journal of Botany*, v. 32, Jan. 1954, p. 48-54 + 1 plate.

A crude aeration precipitate of nabam was found to possess a relatively high order of fungicidal activity. Graph, tables, photographs. 10 ref.

7424 Methyl Bromide as a Soil Fumigant for Controlling Soil-Borne Pathogens and Certain Other Organisms in Vegetable Seedbeds. C. D. McKeen. *Canadian Journal of Botany*, v. 32, Jan. 1954, p. 101-115 + 2 plates.

Results of investigation to determine feasibility of using methyl bromide for sterilization of compost soils used in propagation of vegetables under glass. Tables, photographs. 13 ref.

7425* Mechanism of the Fertilizing Action of Dephosphorization Slags. (French.) G. Barbier and S. Trocmé. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques*, 1954, no. 1, p. 163-173.

Process for producing granulated slag directly at converter exit by pulverizing molten slag by sudden cooling in water. Tables, graphs.

7426 Farm Products to Chemicals. *Chemical and Engineering News*, v. 32, Feb. 22, 1954, p. 708-709.

Atlas Powder Co. plans for a series of surfactants from sugar cane, sugar beets, vegetable oils, animal fats, and wood pulp. Table.

7427 Fertilizer From the Sea. *Chemical Week*, v. 74, Mar. 13, 1954, p. 44-45.

Equipment and process for making potassium nitrate from nitric acid and sea water. Diagram.

7428* We Need New Crops. Wheeler McMillen. *Chemurgic Digest*, v. 13, Feb. 1954, p. 4-5.

Agricultural research necessary for acreage idled by government crop control program. Photograph.

7429* Interference Phenomenon Between Tobacco Mosaic Virus and Virus X of the Potato in the Case of Complex Tomato Disease. (Streak). (French.) Demetrius Zachos. *Comptes rendus*, v. 238, no. 2, Jan. 11, 1954, p. 269-270.

Inhibition in growth of tobacco mosaic virus was observed in presence of virus X. 3 ref.

7430* Influence of Temporary Exclusion of Phosphorus From Cultural Mixtures During Blooming on the Growth of Soy Beans. (Russian.) V. B. Bagaev. *Doklady Akademii Nauk SSSR*, v. 92, no. 4, Oct. 1, 1953, p. 859-861.

Experiments on hydroponic cultures. Increased yields of seeds were obtained. Tables. 6 ref.

7431* Structure and Insecticide Activity of Certain Mixed Esters of Dithiophosphoric Acid. (Russian.) K. A. Gar, N. N. Mel'nikov, Iu. N. Fadeev, and K. D. Shvetsova-Shilovskaia. *Doklady Akademii Nauk SSSR*, v. 94, no. 2, Jan. 11, 1954, p. 241-244.

Efficiency and problems of using organic compounds of phosphorus. Tables. 9 ref.

7432 Fundamental Studies on Behavior of Larval and Adult Mosquitoes and Evaluation of Mosquito Repellents. D. M. DeLong. *Engineering Experiment Stations News (Ohio State University)*, v. 26, Feb. 1954, p. 51-55.

Sensory impulses of mosquitoes and their responses to certain stimuli. Photographs.

7433 Insecticide Research in Entomology. R. H. Davidson and F. W. Fisk. *Engineering Experiment Stations News (Ohio State University)*, v. 26, Feb. 1954, p. 55-57.

Biological activity and properties required of chemical insecticides. Photographs.

7434* New Ways to Use Nitrogen. Ellis Rawnsley. *Farm Quarterly*, v. 9, Spring 1954, p. 32-35, 101-104, 106.

Advantages and disadvantages of gaseous, liquid, and solid forms. Tables, photographs.

7435 Billingham Nitrophosphate. W. D'Leny. *Fertiliser Society, Proceedings, no.* 24, 1953, 14 p. (S631 F41p)

Production formulas and field trials. Photographs.

7436 "Absolute Insect Control". Keith M. Ingold. *Food Engineering*, v. 26, Feb. 1954, p. 57, 138-139.

Design and use of special lethal, fogging atomizers which are fingertip operated from main air-pressure valve. Photographs.

7437* Soil Conditions and Root Diseases. IX. Fungal Ecology of Cultivated Fields-Techniques. Anna T. Zachariah. *Indian Academy of Sciences, Proceedings*, v. 38, sec. B, Dec. 1953, p. 235-241.

Number of genera of fungi developing from colonized root pieces depends on concentration of surface-sterilizing agent used and duration of treatment given. Tables. 15 ref.

7438 Vitamin B_{12} Feed Supplement. Albert S. Hester and George E. Ward. *Industrial and Engineering Chemistry*, v. 46, Feb. 1954, p. 238-243.

History, structure, commercial processes, sterilization, laboratory control, and economic outlook. Photographs, graph, table, diagram, micrograph. 21 ref.

7439* Rodent Control, A Review of Chemical Repellents for Rodents. Jack F. Welch. *Journal of Agricultural and Food Chemistry*, v. 2, Feb. 3, 1954, p. 142-149.

Includes tables, photographs. 30 ref.

7440* Soil Conditioners, Laboratory Evaluation of Polyelectrolytes as Soil Conditioners. R. M. Hedrick. *Journal of Agricultural and Food Chemistry*, v. 2, Feb. 17, 1954, p. 182-185.

Includes graphs, photograph, table. 8 ref.

7441* Feed Supplements, Antibiotics in the Nutrition of Ruminants. J. Thomas Reid, Richard G. Warner, and John K. Loosli. *Journal of Agricultural and Food Chemistry*, v. 2, Feb. 17, 1954, p. 186-192.

Certain antibiotics repress various infectious diseases in young ruminants, stimulate appetite, and result in rapid growth. Table. 65 ref.

7442* Effects of Antibiotics in Control of Plant Diseases. Curt Leben and G. W. Keitt. *Journal of Agricultural and Food Chemistry*, v. 2, Mar. 3, 1954, p. 234-239.

Includes table. **84 ref.**

7443* Detoxification and Toxicological Studies of Tung Meal. G. E. Mann, W. H. Hoffman, Jr., and Anthony M. Ambrose. *Journal of Agricultural and Food Chemistry*, v. 2, Mar. 3, 1954, p. 258-263.

Includes tables, graph. **22 ref.**

Agriculture

7444 Calcium Carbonate as a Diluent for Insecticide Dusts. C. F. Rainwater, E. W. Dunnam, E. E. Ivy, and A. L. Scales. *Journal of Economic Entomology*, v. 46, Dec. 1953, p. 923-927.

Stability of insecticide dusts formulated with $CaCO_3$. Biological tests were conducted against cotton insects. Tables. 9 ref.

7445 Microbioassay of Insecticides in Milk by a Feeding Method. Jung-Yi Tung Sun and Yun-Pei Sun. *Journal of Economic Entomology*, v. 46, Dec. 1953, p. 927-930.

Dieldrin was determnied in cow's milk by feeding house flies treated milk. Method determines micro-quantities of other insecticides in milk or other liquid food. Tables. 4 ref.

7446 Baits for the Control of Resistant Flies. James B. Gahan, R. S. Anders, Henry Highland, and H. G. Wilson. *Journal of Economic Entomology*, v. 46, Dec. 1953, p. 965-969.

Brewers' malt and blackstrap molasses were combined with various insecticides. Tables.

7447* Further Studies on the Alfalfa Factor and Its Relation to the Liver and Whey Factors. H. Fisher, H. M. Scott, and R. G. Hansen. *Journal of Nutrition*, v. 52, Jan. 1954, p. 13-24.

Alfalfa factor in relation to separate unidentified factors in whole liver substance and in dried whey, both of which are known to enhance chick growth. Tables. 11 ref.

7448* Phosphate Fertilizers. III. Thermal Decomposition of Phosphate Rock in Presence of Magnesium Salts. G. T. Gadre. *Journal of Scientific & Industrial Research*, v. 13, sec. B, Jan. 1954, p. 46-48.

Mg salts and sea bittern for thermal decomposition of African rock phosphate. Tables. 6 ref.

7449* The Relationship Between the Constitution and the Effect of Chemical Compounds on Plant Growth. IV. Derivatives and Analogues of 2-Benzoylbenzoic Acid. V. Aromatic Nitro-Compounds and Nitramines. VI. Some Derivatives of Fluorene. R. L. Jones, T. P. Metcalfe, and W. A. Sexton. *Journal of the Science of Food and Agriculture*, v. 5, Jan. 1954, p. 32-47.

Includes photographs, tables. 44 ref.

7450* Studies on Composts Prepared From Waste Materials. I. Preparation, Nitrogen Losses and Changes in 'Soluble Nitrogen'. Delphine A. Hoyle and G. E. G. Mattingly. *Journal of the Science of Food and Agriculture*, v. 5, Jan. 1954, p. 54-64.

Results of experimental studies. Tables, graphs. 33 ref.

7451 Pest Control. *Machinery Lloyd (Overseas Ed.)*, v. 26, Jan. 30, 1954, p. 91, 93, 95-98.

Modern crop-spraying equipment demands a sound knowledge of basic mechanical principles and considerable experience of chemical and biological factors involved. Photographs.

7452* Nitrogen More Than Pays Its Way on California Cotton. C. O. McCorkle, Jr. and D. S. Mikkelsen. *National Fertilizer Review*, v. 29, Jan.-Feb.-Mar. 1954, p. 17-19.

Economic analysis of effects of fertilization on yield. Graphs, tables.

7453 Effects of Alpha-(1-Naphthylmethylsulphide)-Propionic Acid on the Growth of Excised Tomato Roots. H. E. Street. *Nature*, v. 173, Feb. 6, 1954, p. 253-254.

Includes photographs, table. 8 ref.

7454* Resistance of Insects to Lipoid Soluble Insecticides. (German.) R. Langenbuch. *Naturwissenschaften*, v. 41, no. 3, 1954, p. 70.

Resistance was shown to occur in larva stage caused by increased lipoid level. 7 ref.

7455* Absorption of Thiouracil by Tobacco Leaf Tissue and Inhibition of Tobacco Mosaic Virus Multiplication. Carl W. Nichols. *Phytopathology*, v. 44, Feb. 1954, p. 92-93.

Experimental studies. Graphs. 6 ref.

7456* Soil Acidity (Low pH) Spells Fertility Deficiencies. William A. Albrecht. *Pit and Quarry*, v. 46, Mar. 1954, p. 82-86, 130.

Concept that plants are sensitive to degree of fertility deficiency, not to degree of soil acidity. Photographs.

7457* The Effect of Weathering Prior to Harvest on Certain Properties of Cotton Fiber. P. B. Marsh, G. V. Merola, K. Bollenbacher, M. L. Butler, and M. Simpson. *Plant Disease Reporter*, v. 38, Feb. 1954, p. 106-119.

Investigation of changes occuring as a result of exposure to weather during and after period of boll opening and prior to harvest. Photographs, graphs, tables. 17 ref.

7458* Culture Methods for Detecting Seed-Borne Virus in Glacier Barley Seedlings. H. H. McKinney. *Plant Disease Reporter*, v. 38, Mar. 1954, p. 152-162.

Object was to induce a satisfactory expression of chlorotic markings in first three leaves, or if possible the first leaf, of all seedlings from virus-infected seed. It was unnecessary to assay plants for latent virus, permitting early disposal of infected seedlings before they could infect healthy seedlings growing nearby. Tables. 5 ref.

7459* Pentachloronitrobenzene Soil Treatment for Potato Scab and Rhizoctonia Control. W. J. Hooker. *Plant Disease Reporter*, v. 38, Mar. 1954, p. 187-192.

Fungicide was very effective in reducing scab and *Rhizoctonia* on Cobbler potatoes in peat soils of northern Iowa. Tables, photographs. 3 ref.

7460* Acceleration of Fruit Ripening. (Russian.) Nikolae Seledzhanu. *Priroda*, v. 43, no. 1, Jan. 1954, p. 71-75.

Use of ethanol and various other chemicals for artificial ripening of fruit. 10 ref.

7461* Chemico-Biological Processing of Course Feeds. (Russian.) A. I. Skrigan. *Priroda*, v. 43, no. 2, Feb. 1954, p. 93-95.

Chopped feed was placed in a vat and drenched with weak solution of HCl followed by introduction of steam. Diagram.

7462* Researches on Plant Growth Regulators. XXII. Structure Activity. Pt. 7. Sulphonic Acids and Related Compounds. (English.) H. Veldstra, W. Kruyt, E. J. Van Der Steen, and Börje Aberg. *Recueil des travaux chemiques des Pays-Bas*, v. 73, no. 1, Jan. 1954, p. 23-34.

Indole-3-methane-sulfonic acid and 2,3,6-trichlorophenylmethanesulfonic acid were found to be active as growth substances in the pea test. Tables, photographs. 24 ref.

7463* Occurrence and Mineralization of Organic Phosphorus in Soils, With Particular Reference to Associations With Nitrogen, Carbon, and pH. L. M. Thompson, C. A. Black, and J. A. Zoellner. *Soil Science*, v. 77, Mar. 1954, p. 185-196.

In samples from virgin and cultivated soils, organic phosphorus was correlated positively with organic C and total N. Table, graphs. 16 ref.

7464* Phosphorus Utilization by Corn as Affected by Placement and Nitrogen and Potassium Fertilization. W. K. Robertson, P. M. Smith, A. J. Ohlrogge, and D. M. Kinch. *Soil Science*, v. 77, Mar. 1954, p. 219-226.

Experiment with radio phosphorus. Tables. 7 ref.

7465* Soil Physics. *Soil Science Society of America, Proceedings*, v. 17, Oct. 1953, p. 307-336.

Includes "Recording Soil Moisture Automatically", B. L. Korty and H. Kohnke; "A Comparison of Five Methods of Expressing Aggregation Data", F. W. Schaller and K. R. Stockinger; "Moisture Available to Various Crops in Some New Jersey Soils", A. T. Corey and G. R. Blake; "Float-Valve Pressure Control for Porous-Plate Apparatus", R. J. Hanks, E. E. Miller, and C. B. Tanner; "Modulus of Rupture as an Index of Crushing of Soil", L. A. Richards; "A Method for Determining the Stability of Soil Structure Based upon Air and Water Permeability Measurements", R. C. Reeve; "Pressure Distribution in Soil Columns Draining Into the Atmosphere", James N. Luthin and Robert D. Miller; and "Equipment for Subsampling and

Packing Fragmented Soil Samples for Air and Water Permeability Tests", R. C. Reeve and R. H. Brooks.

7466* Soil Chemistry. *Soil Science Society of America, Proceedings,* v. 17, Oct. 1953, p. 337-364.

Includes "Mica Weathering Sequence in the Highfield and Chester Soil Profiles", C. D. Jeffries, B. N. Rolfe, and G. W. Kunze; "Ion Exchange Equilibria in the Presence of Small Amounts of Electrolyte", Moyle E. Harward and N. T. Coleman; "Mineral Content of Low Humic and Hydrol Humic Latosols of Hawaii", T. Tamura, M. L. Jackson, and G. D. Sherman; "Determination of Fixed Soil Potassium", Delbert W. Kolterman and Emil Truog; "The Nature of Phosphate Sorption by Calcium Carbonate", C. V. Cole, Sterling R. Olsen, and C. O. Scott; "The Feeding Power of Plants for Phosphates", Maurice Fried; and "Iron Oxide Removal From Soils and Clays", N. H. Aguilera and M. L. Jackson.

7467* Soil Microbiology. Influence of Rate of Plant Residue Addition in Accelerating the Decomposition of Soil Organic Matter. M. J. Hallam and W. V. Bartholomew. *Soil Science Society of America, Proceedings,* v. 17, Oct. 1953, p. 365-368.

Includes tables, graphs. 10 ref.

7468* Soil Fertility. *Soil Science Society of America, Proceedings,* v. 17, Oct. 1953, p. 369-390.

Includes "Effect of Potash Fertilization on Yield, Stalk Breakage and Mineral Composition of Corn", H. Wittels and L. F. Seatz; "Influence of Fertilizers on the Crude Protein Yields of Bromegrass Pasture in the Matanuska Valley", Winston M. Laughlin; "Availability of High Temperature Process Alkali (Rhenania-Type) Phosphates to Crops When Applied to Calcareous Soil", W. R. Schmehl and E. J. Brenes; "Effectiveness and Recovery of Phosphorus and Potassium Fertilizers Topdressed on Meadows", John Hanway, George Stanford, and H. R. Meldrum; "Investigation of Small Grain Response to Various Applications of Nitrogen, Phosphorus and Potassium on Several Kansas Soils", J. R. Gingrich and F. W. Smith; and "Foliar Feeding of Corn With Urea Nitrogen", C. D. Foy, G. Montenegro, and S. A. Barber.

7469* Soil Classification. *Soil Science Society of America, Proceedings,* v. 17, Oct. 1953, p. 391-405.

Includes "Characteristics of Certain Soils in the Dominican Republic", P. T. Veale; "The Influence of Wind-Blown Material on the Soils of Massachusetts", William G. Colby, Mitchell A. Light, and T. A. Bertinuson; "Brown Forest, Polygenetic and Congeliturbate Profiles of Potter County, Pennsylvania", Kenneth V. Goodman; and "A Basis for Improving the Soil Classification in the Seaward Portion of the Atlantic Coastal Plain", W. S. Ligon and W. H. Lyford.

7470* Soil Conservation. *Soil Science Society of America, Proceedings,* v. 17, Oct. 1953, p. 406-415.

Includes "Selective Loss of Plant Nutrients by Erosion", N. L. Stoltenberg and J. L. White; "Tillage Methods Influence Crop Yields", R. L. Cook, L. M. Turk, and H. F. McColly; and "A Rapid Gas Evolution Method for Calcium Carbonate Equivalent in Liming Materials", J. H. Horton and D. W. Newsom.

7471* Soil Structure and Structure Improvers. (Dutch.) P. K. Peerlkamp, A. J. De Groot, and H. Kuipers. *T.N.O.-Nieuws,* v. 9, no. 94, Jan. 1954, p. 7-15.

Use and action of soil conditioners. Tables, graph, photographs. 14 ref.

7472* Chemical Weedkillers. W. G. Cass. *World Crops,* v. 6, Mar. 1954, p. 99-102.

A review of recent progress. Use is extending rapidly. Photographs. 8 ref.

7473* Use of Calcium Cyanamide for Transformation of Raw Humus and Increased Yield of Forest Products. (German.) R. Themlitz. *Zeitschrift für Pflanzenernährung Düngung Bodenkunde,* v. 64, no. 1, 1954, p. 54-66.

Experiments and favorable results. Tables. 17 ref.

7474* A Colorimeter With Deflection Reading for Determining the Phosphoric Acid in Soils According to Egner's Method. (German.) H. Peter and W. Höhne. *Zeitschrift für Pflanzenernährung Düngung Bodenkunde,* v. 63, no. 3, Dec. 30, 1953, p. 235-241.

Design and operation with high-vacuum photocell. Photograph, diagrams.

Books and Miscellaneous Publications

7475 Plant Diseases in Orchard, Nursery and Garden Crops. Ernst Gram and Anna Webber. 618 p. 1953. Philosophical Library, New York (SB731 G76p2tr) (Translated from the Danish by Evelyn Ramsden.)

Covers nature of plant diseases; diseases of tree and bush fruit, vegetables and herbaceous fruit, and of ornamental plants and trees; and control measures.

See also:
7478 (xanthinin in plant growth)
7571 (properties and uses of wool fat)
7580 (allethrin, new insecticide)
8072 (wild onion and ragweed in dairy feeds)
8076 (cheese grading)
8889 (irrigation of crops with sewage)
9036 (growth of conifers)

BIOCHEMICAL AND BIOPHYSICAL RESEARCH

7476 Synthesis and Biological Activity of Homologs of Pyridoxal and Pyridoxamine. Miyoshi Ikawa and Esmond E. Snell. *American Chemical Society, Journal,* v. 76, Feb. 5, 1954, p. 637-638.

Synthesis of ω-methylpyridoxal and ω-methylpyridoxamine and their corresponding 5-phosphoric acid esters. Under conditions tested they have growth-promoting activity for lactic acid bacteria varying from 1 to 34% that of vitamin B_6 itself. 13 ref.

7477 Intramolecular Heterogeneity in Nucleic Acid Biosynthesis. Kivie Moldave and Charles Heidelberger. *American Chemical Society, Journal,* v. 76, Feb. 5, 1954, p. 679-684.

Intramolecular distribution of radio-activity in partial degradation products of nucleic acids. Tables. 33 ref.

7478 Xanthinin: A Plant Growth-Regulating Compound From *Xanthium Pennsylvanicum*. I. T. A. Geissman, Peter Deuel, Erik K. Bonde, and F. A. Addicott. *American Chemical Society, Journal,* v. 76, Feb. 5, 1954, p. 685-687.

Crystalline compound, xanthinin, was isolated from leaves of *Xanthium pennsylvanicum*. An unsaturated keto lactone with composition $C_{17}H_{22}O_5$, it can be converted by loss of a molecule of acetic acid into xanthatin, $C_{15}H_{18}O_3$. Graphs. 12 ref.

7479* Phenol Coefficients and the Ferguson Principle. Naseem A. Allawala and Sidney Riegelman. *American Pharmaceutical Association, Journal, (Scientific Ed.),* v. 43, Feb. 1954, p. 93-97.

Correlation between thermodynamic activity and antibacterial action has been substantiated through application of the Ferguson principle to a series compounds varying in their phenol coefficients from 1 to 675. It is shown that solutions of these phenols must be 19 to 20% saturated in order to kill a standardized suspension of *M. pyogenes* var. *aureus* in ten minutes. Graphs, table. 25 ref.

7480* Heparinic Effects of Cupridihydroporphyrins (Water-Soluble Chlorophyllins). Robert D. Barnard, Benjamin Goldman, Leon N. Kessler, and Henry T. Stanton, Jr. *American Pharmaceutical Association, Journal, (Scientific Ed.),* v. 43, Feb. 1954, p. 110-113.

Includes tables. 18 ref.

7481* Laboratory Studies on β-Diethylaminoethyl Fencholate, a New Antifungal Agent. Katherine A. Ludwig, F. Joseph Murray, J. Knox Smith, Charles R. Thompson, and Harold W. Werner. *Antibiotics & Chemotherapy,* v. 4, Jan. 1954, p. 56-61.

Includes tables. 4 ref.

7482* A Simple Rapid Disk-Tube Method for Determination of Bacterial Sensitivity to Antibiotics. S. Stanley

Biochemical and Biophysical Research

Schneierson. *Antibiotics & Chemotherapy*, v. 4, Feb. 1954, p. 125-132.

Method and its evaluation. Tables. 5 ref.

7483 The Mitigation of Marine Fouling by Anaerobic Treatment. H. T. Duplice and R. C. Alexander. *ASME, Transactions*, v. 76, Feb. 1954, p. 241-243.

Killing of marine fouling organisms, particularly the bay mussel, in salt cooling water conduits by anaerobic treatment. Graphs, photographs. 7 ref.

7484* Studies in Detoxication. LV. The Metabolism of Alkllbenzenes. (a) Glucuronic Acid Exeretion Following the Administration of Alkylbenzes. (b) Elimination of Toluene in the Expired Air of Rabbits. J. N. Smith, R. H. Smithies, and R. T. Williams. *Biochemical Journal*, v. 56, Feb. 1954, p. 317-320.

Includes table, graph. 23 ref.

7485 Effects of Benzenehexachloride on Soil Microorganisms. I. Experiments With Autotrophic Bacteria. II. Experiments With Urea-Hydrolyzing Bacteria. P. H. H. Gray. *Canadian Journal of Botany*, v. 32, Jan. 1954, p. 1-15.

Includes tables. 9 ref.

7486* Bacteria Are Getting Tougher. *Chemical and Engineering News*, v. 32, Feb. 15, 1954, p. 580, 582.

Increasing resistance of bacteria to penicillin, aureomycin, and terramycin.

7487* A New Aspect of the Action of Vitamin D on Growth. (French.) Jean Causeret. *Comptes rendus*, v. 238, no. 1, Jan. 4, 1954, p. 160-162.

Favorable reaction was found on young rats being fed a calcium deficient diet. Tables, graphs.

7488* Certain Data Concerning the Mechanism of the Enzymatic Activity of Invertase. (Russian.) A. I. Oparin and M. S. Bardinskaia. *Doklady Akademii Nauk SSSR*, v. 94, no. 2, Jan. 11, 1954, p. 305-308.

Activities of invertases obtained from yeast, mold fungi, and higher plants compared by investigation of behavior with regard to β-diethylfructoside, β-ethylfructoside, and alkylfructoside. Photographs. 10 ref.

7489* Cholesterol. III. Pharmacology of Cholesterol. Cholesterol Derivatives. Edgar S. Lower. *Drug and Cosmetic Industry*, v. 74, Feb. 1954, p. 200-201, 294-301.

Includes photographs, tables. (To be concluded.)

7490* Antibiotics as Contamination—Control Agents in Grain Alcohol Fermentations. W. H. Day, W. C. Serjak, J. R. Stratton, and Leonard Stone. *Journal of Agricultural and Food Chemistry*, v. 2, Mar. 3, 1954, p. 252-258.

Includes tables, graphs. 10 ref.

7491 Relative Frequencies of Sectored and Nonsectored Mutant Colonies in Yeast as a Function of Ultraviolet Dose. Allen P. James. *Journal of Bacteriology*, v. 67, Feb. 1954, p. 237-242.

Includes graph, tables. 5 ref.

7492 The Effect of X-Rays on the Macromolecular Organization of *Escherichia Coli*. Daniel Billen and Elliott Volkin. *Journal of Bacteriology*, v. 67, Feb. 1954, p. 191-197.

Includes photographs, tables, graph. 11 ref.

7493* The Utilization of Acetate for Synthesis in *Escherichia Coli*. Kenneth McQuillen and Richard B. Roberts. *Journal of Biological Chemistry*, v. 207, Mar. 1954, p. 81-95.

Incorporation of radioactive acetate into various fractions of actively growing. *Escherichia coli* studied in absence and presence of certain amino acids. Tables, graphs. 14 ref.

7494* Studies of Lactic Acid Bacteria Associated With Brewery Products. I. Identification of Types Isolated From Beer and From Yeast. R. R. Bhandari, C. Russell, and T. K. Walker. *Journal of the Science of Food and Agriculture*, v. 5, Jan. 1954, p. 27-31.

Survey of a selection of lactic acid bacteria occurring in 12 samples of yeast and 9 samples of beer from British breweries. Strains of 8 known species were identified. Tables, micrographs. 20 ref.

7495* Bacteriological Studies on High-Temperature Short-Time Pasteurization of Ice Cream Mix. M. L. Speck, C. A. Groshce, H. L. Lucas, Jr., and L. Hankin. *Journal of Dairy Science*, v. 37, Jan. 1954, p. 37-44.

Results of experimental studies. Tables. 15 ref.

7496* The Correlation Between Feed Consumption and Fecal Flora in Chicks. S. J. Slinger, M. M. Hauser, and W. F. Pepper. *Journal of Nutrition*, v. 52, Jan. 1954, p. 75-88.

An attempt to correlate daily feed consumption and fecal bacterial counts of chicks fed diets with and without an antibiotic, both on a free-choice and an equalized feed intake basis. Graphs, tables. 13 ref.

7497* Studies on the Biological Value of Inorganic Phosphates. M. B. Gillis, L. C. Norris, and G. F. Heuser. *Journal of Nutrition*, v. 52, Jan. 1954, p. 115-125.

Procedure for making more exact comparisons of availability of phosphorus from different sources. Comparative values of some phosphates studied. Tables, graph. 9 ref.

7498 Electron Microscopic Observations on Bacterial Nuclei. J. R. G. Bradfield. *Nature*, v. 173, Jan. 30, 1954, p. 184-186.

New experimental technique and results. Micrographs. 13 ref.

7499 Relative Merits of Cathode Rays and Gamma Radiations. Samuel A. Goldblith and Bernard E. Proctor. *Nucleonics*, v. 12, Feb. 1954, p. 32-35.

Related problems of ionization distribution and bactericidal effects for two types of radiation. Graphs, diagrams, tables. 8 ref.

7500* Sodium Toxicity in Potassium Deficiency. *Nutrition Reviews*, v. 12, Mar. 1954, p. 75-77.

Experimental studies on rats.

7501* Florida Scientists Identify Organism Believed to Cause Deadly "Red Tide". *Southern Chemical Industry*, v. 6, Jan.-Feb. 1954, p. 25.

Attempted cultivation of the organism. Diagram, map.

7502* Bactericidal Properties of Extracts From Upper Skin Layers of the Onion Bulb and the Influence of Certain Conditions of External Surroundings. (Russian.) Iu. F. Shcherbak. *Zhurnal Mikrobiologii, Epidemiologii, i Immunobiologii*, 1954, no. 1, Jan., p. 31-32.

Concludes that dried onion skins yield an extract which is bactericidal on both Gram negative and positive microorganisms. Tables.

7503* Effect of Biogenous Stimulators on Growth of Bacterial Cultures. (Russian.) G. M. Sergeev. *Zhurnal Mikrobiologii, Epidemiologii, i Immunobiologii*, 1954, no. 1, Jan., p. 40-43.

Extracts from liver, spleen, muscle, skin, and brain of man and dogs plus the extract of aloes were tested. Tables.

Books and Miscellaneous Publications

7504 The Physics of Viruses. Ernest C. Pollard. 230 p. 1953. Academic Press, New York. (QR360 P76p)

Presents what is known about viruses from the view point of a physicist. Major aim has proved to be description of viruses, their shape, and structure.

See also:

7654 (vitamin B_6 catalyzed reactions)
7655 (secondary amino mustards)
8685 (effect of α radiation on pharmaceuticals)
8862 (plastics and tissue)
8885 (biological filters for cannery waste waters)
8891 (bacteria for sludge digestion)

CERAMICS AND CONCRETE

7505 Three-Sheet Minerals in Clays. E. J. Weiss and R. L. Stone. *American Ceramic Society, Bulletin,* v. 33, Feb. 1954, p. 51-54.

X-ray and thermal analysis of numerous kaolins and ball clays. Spectrograms, graphs.

7506 Studies on Formation and Recrystallization of Intermediate Reaction Products in the System Magnesia-Silica-Water. George L. Kalousek and Daniel Mui. *American Ceramic Society, Journal,* v. 37, Feb. 1954, p. 38-41.

Includes table, graphs, diagram. 3 ref.

7507 Experimental Study of Fracture of Glass. I. The Fracture Process. E. B. Shand. *American Ceramic Society, Journal,* v. 37, Feb. 1954, p. 52-60.

Concept of fracture is developed from experimental data and found to originate at flaws or cracks of finite size, most of which are at the surface. Photographs, tables, graphs. 37 ref.

7508 Thermal Conductivity. I. Concepts of Measurement and Factors Affecting Thermal Conductivity of Ceramic Materials. W. D. Kingery and M. C. McQuarrie. **II. Development of a Thermal Conductivity Expression for the Special Case of Prolate Spheroids.** Milton Adams and A. L. Loeb. **III. Prolate Spheroidal Envelope Method; Data for Al_2O_3, BeO, MgO, ThO_2, and ZrO_2.** Milton Adams. **IV. Apparatus for Determining Thermal Conductivity by a Comparative Method; Data for Pb, Al_2O_3, BeO, and MgO.** J. Francl and W. D. Kingery. **V. High-Temperature Method and Results for Alumina, Magnesia, and Beryllia from 1000° to 1800°C.** Malcolm McQuarrie. **VI. Determination of Conductivity of Al_2O_3, by Spherical Envelope and Cylinder Methods.** W. D. Kingery. **VII. Analysis of Variation of Conductivity With Temperature for Al_2O_3, BeO, and MgO.** Malcolm McQuarrie. **VIII. A Theory of Thermal Conductivity of Porous Materials.** Arthur L. Loeb. **IX. Experimental Investigation of Effect of Porosity on Thermal Conductivity.** J. Francl and W. D. Kingery. **X. Data for Several Pure Oxide Materials Corrected to Zero Porosity.** W. D. Kingery, J. Francl, R. L. Coble, and T. Vasilos. *American Ceramic Society, Journal,* v. 37, Feb. 1, 1954, p. 67-110.

Includes graphs, photographs, diagrams, tables. 93 ref.

7509 Physics of the Glassy State. I. Constitution and Structure. E. U. Condon. *American Journal of Physics,* v. 22, Feb. 1954, p. 43-53.

Modern views of constitution and structure of inorganic glasses. Tables, graphs, diagrams. 28 ref.

7510* Microscopic Investigations of Fired Dolomite. (German.) Gerhard Trömel. *Archiv für das Eisenhüttenwesen,* v. 24, nos. 11-12, Nov.-Dec. 1953, p. 449-456.

Studies effect of chemical composition and firing temperature on structure and properties of dolomite to determine service-life of refractory dolomite linings. Photomicrographs.

7511* Mechanical Mixing in Compressive Strength Test of Cement Mortar Proposed. *ASTM Bulletin,* 1954, no. 196, p. 24-25.

Contemplated changes in method of test for compressive strength of hydraulic cement mortars (C 109). Photograph.

7512* The Specific Heat and Thermal Conductivity of Graphite. P. G. Klemens. *Australian Journal of Physics,* v. 6, Dec. 1953, p. 405-409.

Temperature variation of thermal conductivity differs from variation of specific heat, even though thermal resistance arises from boundary scattering. 5 ref.

7513* Simplified Method of Determining Grain Size and Clear Discussion of These Conditions for Coarse-Ceramic Purposes. (German.) E. Sobotha. *Berichte der deutschen keramischen Gesellschaft,* v. 30, no. 12, Dec. 1953, p. 286-289.

Sedimentation process and relation between specific volumes of individual grain sizes in wet and dry state. Charts, diagram.

7514* Effect of Different Types of Raw Material on Mineral Composition and Transparency of Porcelain. (German.) A. Dietzel and N. N. Padurow. *Berichte der deutschen keramischen Gesellschaft,* v. 31, no. 1, Jan. 1954, p. 7-18.

Various types of quartz and kaolin were investigated. Micrographs, tables, graphs, photograph. 33 ref.

7515* The Process of Thermal Reaction. (German.) S. Krapf. *Berichte der deutschen keramischen Gesellschaft,* v. 31, no. 1, Jan. 1954, p. 18-21.

Production of ceramic or metal-ceramic bodies by igniting mixture which will react exothermally to form desired compounds. Diagrams, graph, photographs.

7516 Automatic Controls, Streamlined Operation, Features of New Plant. *Brick & Clay Record,* v. 124, Feb. 1954, p. 39, 41-43, 45-46.

New Dickey operation a wonderland of better methods, new techniques. Full use of electronic controls, automatic handling in plant. Mechanical pallet loading of pipe a labor-saving addition. Mix, form, load pipe by pushing buttons. Photographs, diagrams.

7517 Crazing of Wall-Tiles. L. Bullin and K. Green. *British Ceramic Society, Transactions,* v. 53, Jan. 1954, p. 39-63; disc., p. 63-66.

Experimental studies indicate affect of various factors on crazing phenomena. Graphs, tables.

7518* Effect of Quebracho Extract on Clays. Theodore White. *British Clayworker,* v. 62, Feb. 1954, p. 326-328.

Includes graphs. 21 ref.

7519 On the Problem of the Behavior of Mullite at Its Melting Point. N. E. Filonenko and I. V. Lavrov. *Henry Brutcher, Altadena, Calif., Translation no.* 3170, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 89, no. 1, 1953, p. 141-142.)

Study of behavior of mullite at melting point, based on a number of compositions in high alumina part of Na_2O-Al_2O_3-SiO_2 system. Micrographs, tables. 2 ref.

7520 Transformation of Quartz in Presence of a Small Quantity of Mineralizers. I. S. Kainarskii and L. I. Karyakin. *Henry Brutcher, Altadena, Calif., Translation no.* 3190, 10 p. (From *Daklady Akademii Nauk SSSR,* v. 81, no. 5, 1951, p. 887-890.)

Microscopic study of silica brick made with iron bond and containing 98% silica after service in an open-hearth furnace roof. Compares crystallization of the silica in this brick against ordinary silica brick. Table, micrographs. 3 ref.

7521 Clarification of Phase Diagram of Alumina-Silica System. P. P. Budnikov, S. G. Tresvyatskii, and V. I. Kushakovskii. *Henry Brutcher, Altadena, Calif., Translation no.* 3219, 5 p. (From *Doklady Akademii Nauk SSSR,* v. 93, no. 2, 1953, p. 281-283.)

Previously abstracted from original. See item no. 4417, v. 3, Apr. 1954.

7522 Symposium on Casting Control. *Ceramic Age,* v. 63, Feb. 1954, p. 24-29; disc., p. 29-31.

Includes "Vitreous China Sanitary Ware Casting", H. S. Magid; "Vitrified Chinaware Casting", Robert E. Cooley, Jr.; "Vitreous China Sanitary Ware Casting", Roland E. Tucker; and "Technical Phases and Calculations for Casting Control", Girard W. Phelps.

7523 Resistance of Porcelain Enamels to Bleaches. *Ceramic Age,* v. 63, Feb. 1954, p. 34-35.

Indicates common household bleaches may have a significant and hitherto unrecognized deleterious effect on porcelain-enameled sinks and laundry tubs, if bleach manufacturers' directions are not followed. Photographs, graph.

7524* The Drying of Tableware and Other Ceramic Goods by the Jet Drying Method. W. Hancock. *Ceramics,* v. 5, Jan. 1954, p. 507-511.

Includes diagram, graph, photograph, tables.

7525* Test on Treating Serpentine for the Purpose of Obtaining a Product With High Forsterite Content.

Ceramics and Concrete

(French.) Simonne Caillère and Marc Foëx. *Comptes rendus*, v. 238, no. 3, Jan. 18, 1954, p. 351-353.

Product obtained can be used for making ceramic pieces or bricks of high refractory quality. Table. 3 ref.

7526* Detection of Paramagnetic Resonance in Irradiated Glass. (French.) Jean Combrisson and Jean Uebersfeld. *Comptes rendus*, v. 238, no. 5, Feb. 1, 1954, p. 572-573.

Advocates paramagnetic resonance to determine radiations in solid material on tissues. 4 ref.

7527* Problem of the Structure of Borosilicate Glass. (Russian.) S. P. Zhdanov. *Doklady Akademii Nauk SSSR*, v. 92, no. 3, Sept. 21, 1953, p. 597-600.

Structural investigation of porous glass resulting from treatment of alkali-borosilicate and alkali-free borosilicate glasses by acids. Diagram, table, graphs. 7 ref.

7528* X-Ray Determination of the Existence of Solid Solutions in Boron Carbide. (Russian.) G. S. Zhdanov, N. N. Zhuravlev, and L. S. Zevin. *Doklady Akademmi Nauk SSSR*, v. 92, no. 4, Oct. 1, 1953, p. 767-768.

During phase analysis of a series of commercial and laboratory specimens of B_4C some of the X-ray diffraction diagrams showed a displacement of lines deflected under a large angle. Table, diagram. 9 ref.

7529* Investigation of the System Tricalcium Silicate-Tricalcium Phosphate. (Russian.) N. A. Toropov, A. I. Borisenko, and P. V. Shirokova. *Doklady Akademii Nauk SSSR*, v. 92, no. 5, Oct. 11, 1953, p. 1015-1018.

System was investigated at 1450 C. Results are discussed. Table, graphs. 4 ref.

7530* Changes in Liquid Inclusions Under the Influence of Temporary Heating of a Crystal. (Russian.) G. G. Lemmlein and M. O. Kliia. *Doklady Akademii Nauk SSSR*, v. 94, no. 2, Jan. 11, 1954, p. 233-236.

Investigates primary inclusions of glass in quartzes of quartz porphyries from various deposits. These inclusions are shown to have the shape of regular negative crystals which subdivide into two types. Photographs. 3 ref.

7531 Glass Considered as a Polymer. I. J. M. Stevels. *Glass Industry*, v. 35, Feb. 1954, p. 69-72, 100, 102. (Translated from *Verres et refractaires*, v. 7, 1953, p. 91-104.)

Previously abstracted from the original. See item 12976, v. 2, Nov. 1953.

7532 Borates for the Glass Industry. M. H. Pickard. *Glass Industry*, v. 35, Feb. 1954, p. 73-77, 108.

Importance of borates in glass manufacture; status of future supply; quality considerations; and general unit processes and operations involved in manufacture of various boron-containing products. Map, photographs.

7533 The Selection of Refractory Materials for Gas-Fired Equipment. Emil Blaha. *Industrial Heating*, v. 21, Feb. 1954, p. 343-344, 346, 348, 350, 352.

Based on Information Letter 59, "Factors in the Selection of Refractory Materials in Gas-Fired Equipment", issued by Amer. Gas Assoc. Refractory linings for all types of gas-fired industrial furnaces. Graph.

7534 Alumino-Silicate Refractories. E. C. Shears and W. A. Archibald. *Iron & Steel*, v. 27, Feb. 1954, p. 61-66.

Observations on chemistry of the above. Tables, graphs. 64 ref.

7535 Sources of Inclusions From Pouring Refractories Investigated. M. P. Fedock. *Journal of Metals*, v. 6, Feb. 1954, p. 125-127.

Ladle brick, sleeves, nozzles and fireclay mortar are considered as sources of inclusions. Tables, diagram. 3 ref.

7536 Phase Equilibrium Relations in the Systems Lime-Titania and Zirconia-Titania. L. W. Coughanour, R. S. Roth, and V. A. DeProsse. *Journal of Research, National Bureau of Standards*, v. 52, Jan. 1954, p. 37-42.

Systems CaO-TiO_2, and ZrO_2-TiO_2 studied by means of solid-state reactions and by observation of fusion characteristics. An equilibrium diagram suggested for each system. Tables, diagrams, X-ray diffraction pattern. 17 ref.

7537 The System Lime, Alumina, and Water From 50° to 250° C. Richard B. Peppler and Lansing S. Wells. *Journal of Research, National Bureau of Standards*, v. 52, Feb. 1954, p. 75-92.

Includes tables, graphs, micrograph. 15 ref.

7538* Glassblowing. (2nd Series.) I. J. A. Frost. *Laboratory Practice*, v. 3, Feb. 1954, p. 60-62.

Includes diagrams. (To be continued.)

7539* Differential Thermal Analysis. (Hungarian.) Mária Vogl Földváriné. *Magyar Kémikusok Lapja*, v. 9, no. 1, Jan. 5, 1954, p. 5-12.

Reviews history as applied to identification of constituants of clay. Method based on principle that inert matter is replaced by either an arbitrarily chosen component of material to be investigated or mixture of known composition of several components. Graphs, diagrams. 10 ref.

7540* The Foam Method of Insulating Refractories Production. (Polish.) S. Pawlowski. *Prace Instytutow Ministerstwa Hutnictwa*, 1954, no. 6, p. 305-313.

Foamed refractory products suitable for thermal insulation can be used for direct insulation at temperatures of 1350 to 1400 C. Diagrams, tables, graph, photographs. 10 ref.

7541* X-Ray Method of Quantitative Determination of Mullite in Refractories. (Polish.) Z. Ziolowski. *Prace Instytutow Ministerstwa Hutnictwa*, 1954, no. 6, p. 314-321.

Sources of possible error and degree of relative error. For a mullite content of 20 to 80%, error was about 14%. Graphs, tables, photograph, radiographs. 19 ref.

7542 Production of Light Building Material by Sintering Boiler Slag and Other Waste Materials. (Polish.) W. Sabela. *Prace Instytutow Ministerstwa Hutnictwa*, 1954, no. 6, p. 329-337.

Investigates boiler and blast furnace slags and clays. Products obtained can be used with advantage as building materials, but relatively high-plant-installation costs retard their production. Graphs, tables, photographs, diagrams. 5 ref.

7543* Mierolite. (Russian.) I. I. Kitaigorodskii. *Priroda*, v. 43, no. 1, Jan. 1954, p. 85-88.

Structure and properties of corundum microlite. Diagram, micrographs.

7544* Experiments With Firebrick Batch for Dry-Pressing. J. M. McWilliam and J. McM. Gilmour. *Refractories Journal*, v. 30, Jan. 1954, p. 10-16.

Summary of a paper presented at Refractory Materials Section, British Ceramic Society, London, Nov. 1953. Tables, diagram.

7545 Potential Uses of Super-Refractories. M. W. Thring. *Research*, v. 7, Feb. 1954, p. 54-59.

Refractory materials which can withstand effects of elevated temperatures, chemical attack, and erosion. Diagrams. 4 ref.

7546* Production of Lightweight Aggregates. H. G. Iverson. *Rock Products*, v. 57, Feb. 1954, p. 110, 138, 140.

Production from clays and shales. Photograph.

7547* Lime Calcination and Hydration Research. Victor J. Azbe. *Rock Products*, v. 57, Feb. 1954, p. 118, 120, 140.

German research work develops effect of calcining temperature and time on reactivity of resulting lime. Graphs.

7548 Torsion Testing Equipment for Cylindrical Cement Specimens. E. K. Muhlhausen, A. C. Loewer, Jr., and W. J. Eney. *Society for Experimental Stress Analysis, Proceedings*, v. 11, 1953, p. 97-104.

Torsion loader and a torsion strain gage and design and results of their combined application on pilot specimens. Diagrams, graphs, photographs.

7549* A Study of the Reaction Rates Between Silica, Alumina, Mullite, Zirconia and Other Oxides at Various

Temperatures. Abd-El-Moneim Abou-El-Azm. *Society of Glass Technology, Journal*, v. 37, no. 179, Dec. 1953, p. 269T-301T.
Reactions were investigated and discussed. Graphs, tables.

7550* Avoiding Pinholes, Egg Scales, and Scabs in Porcelain Glazing. (German.) E. Kempcke. *Sprechsaal*, v. 87, no. 1, Jan. 5, 1954, p. 1-3; no. 2, Jan. 20, 1954, p. 26-30.
Changes in glaze composition to prevent blemishes. Raw material, percentages, rational compositions, Seger-formula, and fluidity ranges of glaze compositions. Tables.

7551* Influence of Mineralizers on Mechanical, Thermal, and Dielectric Properties of Porcelain. (Russian.) P. P. Budnikov. *Steklo i Keramika*, v. 11, no. 1, Jan. 1954, p. 4-7.
Introduction of ZnO, TiO_2, and furnace slag was shown to increase mullitization and improve mechanical and thermal properties. Tables, micrographs.

7552* Nomograms for Determining Viscosity of Industrial Silicate Glasses. (Russian.) M. W. Okhotin. *Steklo i Keramika*, v. 11, no. 1, Jan. 1954, p. 7-11.
Range of 10^3 to 10^{13} poises is covered. Tables, graphs.

7553* Advances in Concrete Technology. W. Fisher Cassie. *Times Science Review*, 1954, Spring, p. 16-17.
Air entrainment, pre-stressing, and non-destructive testing. Photographs, graphs, diagrams.

7554* Accelerated Method of Determining Activity of Blast Furnace Slags. (Russian.) V. T. Illiminskaia. *Tsement*, v. 20, no. 1, Jan.-Feb. 1954, p. 17-19.
Quantity of $CaSO_4$ in slag determined by volumetric benzidine method. Table.

7555 Thermal Shock Resistance and High-Temperature Strength of a Molybdenum Disilicide-Aluminum Oxide Ceramic. W. A. Maxwell and R. W. Smith. *U. S. National Advisory Committee for Aeronautics, Research Memorandum* E53F26, Oct. 1, 1953, 8 p. (Un3.5.08)
A ceramic having nominal composition of 75% Mo disilicide and 25% Al oxide was evaluated in thermal shock by two methods and high temperature modulus of rupture strengths were determined. Photograph, tables.

7556* Relaxation Tests on Glass Specimens Having Different Annealing States. (French.) P. Migeotte and H. Vandecapelle. *Verres et réfractaires*, v. 7, no. 5, Sept.-Oct. 1953, p. 275-280.
Behavior of hot glas subjected to creep tests under constant load and relaxation tests during which stress applied to specimen decreases at such a rate that initial deformation of specimen remains constant. Graphs.

7557* Rapid Determination of Na_2O in Glass by Flame Spectrophotometry. (French.) Roger Demoulin and Lucien Léger. *Verres et réfractaires*, v. 7, no. 6, Nov.-Dec. 1953, p. 331-338; disc., p. 338.
Purpose and principle of flame spectrophotometry; Beckmann apparatus; and types of interference likely to cause systematic errors. Photographs, table, graph, diagrams.

7558* Polarization of Refractory Oxides Immersed in Molten Glass. (French.) Pierre Le Clerc and Ivan Peychès. *Verres et réfractaires*, v. 7, no. 6, Nov.-Dec. 1953, p. 339-345.
Effects of molten glass on electrical behavior of oxide coated electrodes. Photographs, diagrams, autoradiographs.

7559* The Reactivity and Titration of Clay Minerals. (German.) Kurt Fischbeck and Emil Messmer. *Zeitschrift für anorganische und allgemeine Chemie*, v. 274, nos. 1-3, Dec. 1953, p. 1-10.
Review of literature. Effects of acids on conductivity and conductometric titration of suspensions of clay in water. Graphs, table. 26 ref.

7560* The Viscosity-Temperature Behavior of Glass Melts. (German.) Joachim Ernst Quincke. *Zeitschrift für Elektrochemie*, v. 57, no. 8, 1953, p. 715-720.
Experimental arrangement of measuring viscosity of glass-melts used for production of fibers. Tables, diagrams, graphs. 9 ref.

See also:
7600 (tunnel driers)
7664 (organic derivatives of clay minerals)
7714 (quarternary system $CaO-Al_2O_3-TiO_2-SiO_2$)
7817 (corrosion of refractories in liquid metals)
7915 (ceramic phonograph pickup)
8174 (refractory chamber to contain engine blasts)
8237 (adsorption studies on clay minerals)
8374 (wear of graphite electrodes)
8644 (ceramic–metal interactions)
8646 (cermets for gas turbines)
8981 (graphite heat exchangers)
9001 (glass-metal union with plastic adhesives)

CHEMICAL ENGINEERING

7561* On the Theory and Use of the Hydrocyclone. (English.) G. Tarján. *Acta Technica Academiae Scientiarum Hungaricae*, v. 7, nos. 3-4, 1953, p. 389-411.
Theory of operation and advantages in coal dressing and ore beneficiation. Tables, graphs. 11 ref.

7562 Adhesive and Resin Manufacturers. I. British Resin Products Limited. D. N. Davies. *Adhesives & Resins*, v. 2, Jan. 1954, p. 8-13.
Foundation, history, and current activities. Diagram, photograph.

7563* A Decade of Progress in Submarine Water Purification. Frank E. Clark. *American Society of Naval Engineers, Journal*, v. 66, Feb. 1954, p. 125-151.
Methods and apparatus used in making sea water drinkable. Photographs, drawings, tables, graphs.

7564* Continuous Production of Activated Silica With Carbon Dioxide Gas. Robert V. Andrews. *American Water Works Association, Journal*, v. 46, Jan. 1954, p. 82-92.
Experiments indicate that a satisfactory activated silica can be produced continuously over a very wide range of conditions and on a commercial scale. Graphs, diagrams, photograph. 5 ref.

7565* Silicones as Antifoam and Adhesion Agents During Treatment of Bituminous and Similar Materials. (German.) Herbert Schmidt. *Bitumen, Teere, Asphalts, Peche*, v. 4, no. 12, Dec. 1953, p. 337-339.
Various uses of silicone oil. 5 ref.

7566* Cleaning Fine Coal in a Feldspar Jig at Brazeau. A. McMullen. *Canadian Mining and Metallurgical Bulletin*, v. 47, no. 502, Feb. 1954, p. 86-89.
Equipment and processes. Diagrams, tables.

7567 Sensitive Solids Dried Gently. *Chemical Engineering*, v. 61, Mar. 1954, p. 276, 278.
New cylinder dryer does the job without scorching particles. Photographs.

7568* Operating Results of a Sprinkling Evaporator. (German.) Anast. Konstas. *Chemie-Ingenieur-Technik*, v. 25, no. 12, Dec. 1953, p. 715-717.
Evaporation plant where the sirup is sprinkled on Cu pipes heated with circulating water. Diagram, tables.

7569* Performance of Revolving Filters. Influence of the Thickening Degree of the Charge, of the Resistance of the Filter Drum Cover, and of the Penetrability of the Filter Cake. (German.) H. Autenrieth. *Chemie-Ingenieur-Technik*, v. 25, no. 12, Dec. 1953, p. 731-735.
Includes graphs. 4 ref.

7570* New Experiments With Driers. (German.) Saburo Kamei and Ryozo Toei. *Chemie Ingenieur-Technik*, v. 26, no. 1, Jan. 1954, p. 1-9.
Investigations on tunnel, trough, and current driers to obtain mathematical data for design improvement. Tables, graphs, diagrams. 4 ref.

Chemical Engineering

7571* Wool Fat, an Interesting Raw Material for the Chemical Industry. (German.) Elisabeth Zickler. *Chemische Industrie*, v. 6, no. 2, Feb. 1954, p. 73-75.

High degree of stability, high cholesterol content, other valuable properties; uses in numerous medical, cosmetic, and industrial preparations.

7572 A Vacuum Vapour-Liquid Equilibrium Still. S. R. M. Ellis and B. A. Froome. *Chemistry & Industry*, 1954, no. 9, Feb. 27, p. 237-240.

Apparatus, operating characteristics, and experimental results. Diagrams, tables, graphs. 16 ref.

7573 The Coal Age Preparation Guidebook. *Coal Age*, v. 59, Mar. 1954, 51 p.

Includes "How to Produce Quality Coal at Low Cost", and "Preparation Buying Guide". Table, diagrams.

7574 Demineralization vs. Evaporation. S. Baron and I. Gabel. *Consulting Engineer*, v. 3, Feb. 1954, p. 24-27.

Advantages for treating power plant makeup water. Photograph, tables, diagrams.

7575* Theory of Thermogradient Drying of Film Materials. (Russian.) I. N. Goufman, A. G. Amelin, and S. M. Levi. *Doklady Akademii Nauk SSSR*, v. 92, no. 4, Oct. 1, 1953, p. 759-762.

Method reduces danger of damage during drying process. Table, diagram. 8 ref.

7576 High-Speed Cracking of Liquid Hydrocarbons. (Russian.) K. P. Lavrovskii, A. M. Brodskii, and G. A. Garunov. *Doklady Akademii Nauk SSSR*, v. 92, no. 5, Oct. 11, 1953, p. 967-970.

Proposed formulas make it possible to determine limits of application. Experimental investigation showed practical values of formulas. Tables. 9 ref.

7577* Study of the Chemical Reactions of Catalytic Cracking of Isooctane and *n*-Hexane by the Kinetic Method. (Russian.) B. V. Klimenok, E. A. Andreev, and V. A. Gordeeva. *Doklady Akademii Nauk SSSR*, v. 94, no. 2, Jan. 11, 1954, p. 281-284.

Primary final reaction products and secondary products of isooctane and *n*-hexane on alumino-silicate catalysts at 500 and 520 C. Diagram, graphs. 8 ref.

7578 Diaphragm Type Amalgam Caustic-Chlorine Cell. Chas. Potter and A. L. Bisio. *Electrochemical Society, Journal*, v. 101, Mar. 1954, p. 158-161.

Experimental apparatus and procedures. Diagram, graphs. 15 ref.

7579 Reflux and Plate Determinations for Batch Distillation. S. R. M. Ellis. *Industrial and Engineering Chemistry*, v. 46, Feb. 1954, 279-282.

Gilliland's empirical reflux and plate correlations extended to batch distillation by use of a family of curves. Method is of value in separation of close boiling components, since it can be readily applied with an accuracy of the order of Smoker equation. Graphs, tables. 21 ref.

7580 A Staff-Industry Collaborative Report. Allethrin. Howard J. Sanders and Albert W. Taff. *Industrial and Engineering Chemistry*, v. 46, Mar. 1954, p. 414-426.

Manufacture of new insecticide, harmless to man and animals, primarily effective against flies and mosquitos. Photographs, tables, diagrams. 27 ref.

7581 Kinetics of Propylene and Ethylene Hydrogenation. M. V. Sussman and Charles Potter. *Industrial and Engineering Chemistry*, v. 46, Mar. 1954, p. 457-465.

Study of hydrogenation rate of propylene over a Cu-MgO catalyst, using a "differential" bed flow reactor. Diagrams, tables, graphs. 27 ref.

7582 Effect of Initiation Temperature on Continuous Emulsion Polymerization. M. Feldon and R. F. McCann. *Industrial and Engineering Chemistry*, v. 46, Mar. 1954, p. 465-467.

Studies conducted with a 12-stage continuous emulsion polymerization system on effect of initiation conditions on monomer conversion at 41 F. Graph, tables. 10 ref.

7583 Ethyl and *Iso*propyl Benzene, Keystones of the Petrochemical Industry. Peter W. Sherwood. *Industrial Chemist and Chemical Manufacturer*, v. 30, Feb. 1954, p. 71-74.

Methods employed for converting ethyl benzene to styrene. New process for production of phenol from *iso*propyl benzene. Photographs, diagram.

7584* High Pressure Synthesis. W. B. Dunwoody. *Instrumentation*, v. 7, no. 2, 1954, p. 27-31.

Efficient version of Claude process, plus modern instrumentation, for high pressure synthesis of NH_3 in manufacture of low-cost nitrogenous fertilizers. Photographs, diagram.

7585 Fluid 'Hydroforming'. Henry G. McGrath. *Journal of Applied Chemistry*, v. 4, Jan. 1954, p. 26-38.

Represents first successful commercial exploitation of the powdered catalyst technique in a flow system under substantial pressure. Tables, diagrams, graphs. 7 ref.

7586* Pressure Measurement in Chemical Factories. J. R. Fawcett. *Manufacturing Chemist*, v. 25, Feb. 1954, p. 53-56.

Modern instruments; their use for pressure measurement, indicating liquid level, specific gravity, and temperature of saturated vapors; and suitability for control and alarm systems. Diagrams, photographs.

7587* Coal Research in 1953. John Mitchell and William L. Glowacki. *Mining Congress Journal*, v. 40, Feb. 1954, p. 85-89, 95.

Developments in coal utilization as a fuel and as a raw material. Photographs.

7588 Natural Gas to Ammonia, Expansion Program. John C. Reidel. *Oil and Gas Journal*, v. 52, Mar. 8, 1954, p. 86-91, 109-110, 112.

Equipment, plant layout, and operating procedures. Diagrams, tables, photographs. 7 ref.

7589 CO Boiler, Fluidized-Bed Steam Superheater Feature Sinclair F.C.C. Plant. O. F. Campbell and N. E. Pannels. *Oil and Gas Journal*, v. 52, Feb. 22, 1954, p. 132-136, 176-179.

Advantages of design. Photographs, diagrams, tables.

7590 Manufacture and Properties of Dehydrated Castor Oil. P. Slansky. *Paint Manufacture*, v. 24, Feb. 1954, p. 45-48, 56.

Methods for dehydration of castor oil in the laboratory and on a commercial scale. Tables. 8 ref.

7591* Industrial Petroleum Chromatography. III. Evolution of Petroleum Chromatographic Research (1935-1953). Pt. 3. Independent Petroleum Chromatographic Research. Herbert Weil. *Petroleum*, v. 17, Mar. 1954, p. 88-91.

55 ref.

7592 Development of Petroleum and Petrochemical Processing. III. Competitive Raw Materials and Processes for Petrochemicals. Benjamin T. Brooks. *Petroleum Engineer*, v. 26, Mar. 1954, p. C9-C12, C14-C16, C18.

Includes photographs, table. 6 ref. (To be continued.)

7593 Making High Purity Aromatics. W. K. Jackson, C. K. Chadd, and D. M. Krausse. *Petroleum Processing*, v. 9, Feb. 1954, p. 233-237.

Economics of processes. Graphs, tables. 6 ref.

7594 Calculate Capacities of Perforated Plates. Frederick A. Zenz. *Petroleum Refiner*, v. 33, Feb. 1954, p. 99-102.

Study resulted in original method for calculating vapor and liquid capacities. Diagrams, graphs, table. 17 ref.

7595 Petrochemical Reactions. IX. Alcohols From Olefins. Lewis F. Hatch. *Petroleum Refiner*, v. 33, Feb. 1954, p. 141-144.

Includes tables, diagram. (To be continued.)

7596 Simplify Refinery Calculations. Louis J. Murphy. *Petroleum Refiner*, v. 33, Feb. 1954, p. 145-148.

Charts, covering many phases of refinery and petrochemical plant design, have proven themselves to be excellent time savers during any planning work. Charts.

7597* Water Conditioning — Particularly Boiler Feedwater Treatment. J. L. Curry. *Plant*, v. 9, Mar. 1954, p. 44-47, 83.

Treatment, effect on steam production, corrosion, carry-over, deposition, after treatment, and examples of typical basic systems. Photographs, graphs.

7598* Applied Chemical Kinetics. VII. The Determination of Kinetic Constants. (French.) J. C. Jungers and A. Giraud. *Revue de l'institut francais du petrole et Annales des combustibles liquides*, v. 8, no. 12, Dec. 1953, p. 561-585.

Includes diagrams, graphs, tables.

7599* Solvent Refining of Low Temperature Tar With Liquid Ammonia. (English.) Kiyoharu Ishida. *Science Reports of the Research Institutes, Tohoku University*, ser. A, v. 5, no. 4, Aug. 1953, p. 377-394.

Includes tables, equilibrium diagrams, graphs. 13 ref.

7600* Problems in Exploitation of Tunnel Driers. (Russian.) M. S. Lur'e. *Steklo i Keramika*, v. 11, no. 1, Jan. 1954, p. 24-27.

Reasons for malfunctioning; stratification phenomena. Diagrams, table.

7601* Dayton's New Treatment Plant. Vernon R. Kneer. *Water & Sewage Works*, v. 101, Mar. 1954, p. 95-102.

Operation of largest U. S. well-water softening and iron removal installation. Tables, photographs, diagrams, graph.

7602* Rapid Catalytic Processes and the Oxidation of Sulfur Dioxide to Anhydrous Sulfuric Acid. II. General Rules on Gas-Flow Carrying Tubes. Effect of Dilution With Inert Gases. (German.) Leonid Andrussow. *Zeitschrift für Elektrochemie*, v. 57, no. 10, 1953, p. 934-943.

Includes tables, graphs. 8 ref.

Books and Miscellaneous Publications

7603 Cooling Towers. J. Jackson. 104 p. 1951. Butterworths Scientific Publications, London. (TP363 J13c)

Water as an industrial cooling agent; methods of cooling water; design of mechanical-draught towers; the grid-packed induced-draught tower; gas-cooling towers; and the transfer unit method.

7604 Absorption Towers. G. A. Morris and J. Jackson. 159 p. 1953. Butterworths Scientific Publications, London. (TP156.A3 M83a)

Concerned essentially with packed towers in which adsorption and desorption of gases are most frequently carried out. Other types of apparatus briefly described. Methods and data for designing full-scale towers which are both technically and economically satisfactory.

See also:
8000 (expansion of chemical industry in Europe)
8101 (washing of coal)
8112 (chemicals from coal)
8205 (pneumatic transmission and control in water plants)
9018 (manufacture of glue)

CHEMISTRY—ANALYTICAL AND INORGANIC

7605 Effect of Structure on the Polarographic Reduction of Iodo Compounds. Eugene L. Colichman and Shih Kung Liu. *American Chemical Society, Journal*, v. 76, Feb. 5, 1954, p. 913-915.

Polarographic properties of 29 different iodo compounds. Results considered in terms of Hammett's linear free-energy relationship between structure and reactivity. Graphs, table. 9 ref.

7606 A Qualitative Test for Silicon in Organosilicon Compounds and for Germanium in Organogermanium Compounds. Henry Gilman, Robert K. Ingham, and Richard D. Gorsich. *American Chemical Society, Journal*, v. 76, Feb. 5, 1954, p. 918-919.

A variety of compounds were tested. Positive result obtained in every case. Tables. 21 ref.

7607 The Determination of Silicon in Tungsten and Titanium Metal Powders, Carbide Sintering Alloys, Tungstic Oxide and Tungstates. B. Bagshawe and R. J. Truman. *Analyst*, v. 79, Jan. 1954, p. 17-23.

Includes tables. 2 ref.

7608 The Absorptiometric Determination of Tellurium in Tellurium-Lead Alloys. E. G. Brown. *Analyst*, v. 79, Jan. 1954, p. 50-53.

Includes diagram, table. 8 ref.

7609 The Quantitative Analysis of Iron-Stones Containing Small Amounts of Titanium, Vanadium, Manganese, Chromium and Phosphorus. D. N. Grindley, E. H. W. J. Burden, and A. H. Zaki. *Analyst*, v. 79, Feb. 1954, p. 95-100.

Apparatus, reagents, and techniques. Tables. 15 ref.

7610* Separation of Microgram Quantities of Aluminum and Iron(III). (English.) Harry Teicher and Louis Gordon. *Analytica Chimica Acta*, v. 9, no. 6, Dec. 1953, p. 507-512.

Separation of up to 200 micrograms of Fe^{+3} from comparable amounts of Al permit determination of the latter element in caustic liquors and other alkali products by spectrophotometric method of Kenyon and Bewick. Tables. 4 ref.

7611* Colorimetric Determination of Chromium in Titanium Alloys. George Norwitz and Maurice Codell. **Colorimetric Determination of Carbon in Titanium.** Maurice Codell, George Norwitz, and Orien W. Simmons. **Colorimetric Determination of Niobium in Titanium Alloys.** (English.) George Norwitz, Maurice Codell, and Frank D. Verderame. *Analytica Chimica Acta*, v. 9, no. 6, Dec. 1953, p. 546-574.

Includes tables, graphs. 157 ref.

7612* The Separation and Determination of Tungsten and Molybdenum by Means of Calcium Chloride. (French.) Arthur de Sousa. *Analytica Chimica Acta*, v. 10, no. 1, Jan. 1954, p. 29-33.

Rapid and simple method. Table. 22 ref.

7613* Mandelic Acid and Halogen-Substituted Mandelic Acids as Reagents for the Determination of Zirconium. (English.) R. Belcher, A. Sykes, and J. C. Tatlow. *Analytica Chimica Acta*, v. 10, no. 1, Jan. 1954, p. 34-47.

Preparations of three fluoro- and three trifluoro-methyl substituted mandelic acids and possible uses as precipitants for Zr. Tables, graph. 21 ref.

7614* Heterometric Micro-Determination of Magnesium With Oxine in the Presence of Foreign Metals. (English.) M. Bobtelsky and Y. Welwart. *Analytica Chimica Acta*, v. 10, no. 2, Feb. 1954, p. 156-160.

Method for direct determination in presence of excess amounts of Al, Zn, Cd, Mn, and Ca. Graphs, table. 5 ref.

7615* The Polarographic Behaviour of Some Elements in Concentrated Calcium Chloride Solution. IV. The Development of a Method for the Determination of Metallic Impurities in Calcium Metal. (English.) G. F. Reynolds, H. I. Shalgosky, and T. J. Webber. *Analytica Chimica Acta*, v. 10, no. 2, Feb. 1954, p. 192-200.

Determination of Cu, Cr, Pb, Cd, and Mn in calcium metal. Details and results presented. Diagram, graph, tables. 5 ref.

7616 Chromatographic Fractionation of Crude Petroleum Oils. Clarence Karr, Jr., W. D. Weatherford, Jr., and R. G. Capell. *Analytical Chemistry*, v. 26, Feb. 1954, p. 252-256.

Application of the technique of elution chromatography to fractionation of undiluted virgin crude oils. Typical data demonstrate type and extent of fractionation obtained using alumina and bauxite adsorbents. Diagrams, tables, photograph, graphs. 11 ref.

Chemistry—Analytical and Inorganic

7617 Flow and Distribution of Solutions in Filter Paper. Scott E. Wood and Harold H. Strain. *Analytical Chemistry,* v. 26, Feb. 1954, p. 260-264.

Investigation was made in an effort to place paper chromatography on a more quantitative basis. Tables, diagram. 13 ref.

7618 Electrochromatographic Sequences. T. R. Sato, William P. Norris, and Harold H. Strain. *Analytical Chemistry,* v. 26, Feb. 1954, p. 267-271.

Relative migration rates of various cations were determined. Tables, photographs, graph. 20 ref.

7619 Polarographic Studies With Gold, Graphite, and Platinum Electrodes. Samuel S. Lord, Jr. and L. B. Rogers. *Analytical Chemistry,* v. 26, Feb. 1954, p. 284-295.

Includes tables, graphs. 26 ref.

7620 Pyrohydrolysis in the Determination of Fluoride and Other Halides. James C. Warf, W. D. Cline, and Ruth D. Tevebaugh. *Analytical Chemistry,* v. 26, Feb. 1954, p. 342-346.

Includes diagram, tables, graphs. 23 ref.

7621 Functional Group Analysis. R. A. Glenn and Elizabeth D. Olleman. *Analytical Chemistry,* v. 26, Feb. 1954, p. 350-352.

Progress on determintaion of classes of O- and N-compounds present in coal hydrogenation oils. Tables. 16 ref.

7622 Determination of Hydrocarbon Gases as Air Contaminants. E. R. Quiram, S. J. Metro, and J. B. Lewis. *Analytical Chemistry,* v. 26, Feb. 1954, p. 352-354.

Includes table, graph. 6 ref.

7623 Acetylacetone as an Analytical Extraction Agent. John F. Steinbach and Henry Freiser. *Analytical Chemistry,* v. 26, Feb. 1954, p. 375-379.

Extraction characteristics of trivalent metals such as Al, Ga, and In. Tables, graph. 11 ref.

7624 Determination of Nitrogen in Zirconium by Micro-Kjeldahl Steam Distillation. J. F. Rodgers and G. J. Harter. *Analytical Chemistry,* v. 26, Feb. 1954, p. 395-396.

Includes diagram. 3 ref.

7625 Critical Factors in Determination of Oxygen in Titanium by the Vacuum-Fusion Method. W. M. Albrecht and M. W. Mallett. *Analytical Chemistry,* v. 26, Feb. 1954, p. 401-402.

Includes table. 5 ref.

7626 Reduction by Aluminum Powder in Aqueous Solution Titrimetric Determination of Molybdenum. E. Raymond Riegal and Robert D. Schwartz. *Analytical Chemistry,* v. 26, Feb. 1954, p. 410-411.

Includes tables. 10 ref.

7627 Boron Determination in Soils and Plants. W. T. Dible, Emil Truog, and K. C. Berger. *Analytical Chemistry,* v. 26, Feb. 1954, p. 418-421.

Simplified curcumin procedure. Tables, graphs. 14 ref.

7628* Separation and Identification of Chlorinated Organic Pesticides by Paper Chromatography. IV. The Components of Dilan. Lloyd C. Mitchell. *Association of Official Agricultural Chemists, Journal,* v. 37, Feb. 1954, p. 216-217.

Includes table. 5 ref.

7629* The Kinetics of Oxidation of *N*-Methylacridan; A Model for Coenzyme I. S. J. Leach, J. H. Baxendale, and M. G. Evans. *Australian Journal of Chemistry,* v. 6, Nov. 1953, p. 409-420.

Results of experimental studies. Graphs, table. 25 ref.

7630* Volumetric Determination of Cobalt as Dead-Stop Titration. (German.) Helmut Fritzsche. *Brennstoff-Chemie,* v. 35, nos. 3-4, Feb. 17, 1954, p. 49-51.

Rapid new method and results of potentiometric process. Accuracy and equipment are indicated. Table, graph. 11 ref.

7631 Determination of Coefficient of Diffusion of Hydrogen by an Electrochemical Method. E. A. Aikazyan and A. I. Fedorova. *Henry Brutcher, Altadena, Calif., Translation no.* 3127, 8 p. (From *Doklady Akademii Nauk SSSR,* v. 86, no. 6, 1952, p. 1137-1140.)

Previously abstracted from original. See item 13046, v. 2, Nov. 1953.

7632 Determination of Cerium in Steel by Potentiometric Method. S. I. Malov, E. F. Pen'kova, and A. S. Koroleva. *Henry Brutcher, Altadena, Calif., Translation no.* 3141, 3 p. (From *Zavodskaya Laboratoriya,* v. 14, no. 8, 1948, p. 349-350.)

Determination of equivalent point by potentiometric method and separation of Ce from Fe, Ni, Cr, and part of the Mn by electrolysis with a Hg cathode.

7633 Comparative Evaluation of Results of Oxygen Analysis of Steel by Chemical as Against Vacuum-Fusion Method. V. A. Mchedlishvili and A. M. Samarin. *Henry Brutcher, Altadena, Calif., Translation no.* 3194, 7 p. (From *Izvestiya Akademii Nauk SSSR, OTN,* 1953, no. 3, p. 378-382.)

Need for exact methods of O determination in development of best possible melting practices and in studies of physical chemistry of steel making. Tables, graph. 2 ref.

7634 Spectrographic Determination of Nitrogen in Steel. S. L. Mandel'shtam and O. B. Fal'kova. *Henry Brutcher, Altadena, Calif., Translation no.* 3203, 17 p. (From *Zavodskaya Laboratoriya,* v. 16, no. 4, 1950, p. 430-438.)

Two approaches to development of a suitable spectrographic method based on simultaneous extraction of gas and its excitation in discharge between sample and counter electrode. Diagrams, graphs, spectrograms, photograph, tables. 2 ref.

7635* The Determination of Nitrogen and Aluminum in Various Aluminum Killed Steels. (French.) Jean. *Centre de Documentation Siderurgique, Circulaire d'Informations Techniques,* 1954, no. 2, p. 309-321.

Experimental study. Tables, graph, diagram. 14 ref.

7636 Analytical Chemistry of W & Mo. II. *Chemical Age,* v. 70, Jan. 30, 1954, p. 309-312.

Includes tables, graphs. 8 ref.

7637* Polarographic Determination of Carbon Bisulfide With the Help of an Anodic Wave. (German.) P. Zuman, R. Zumanová, and B. Soucek. *Collection of Czechoslovak Chemical Communications,* v. 18, no. 5, Oct. 1953, p. 632-647.

Anodic wave detected in an ethanol solution of diethylamine after inclusion of CS_2. Diagram, graphs. 102 ref.

7638* Simple Infrared Photometer Applied to Chemical Analysis. (French.) Alain Berton. *Comptes rendus,* v. 238, no. 4, Jan. 25, 1954, p. 477-479.

Operation and application. 4 ref.

7639 The Determination of Nickel in Nickel Plating Solutions Using Disodium Ethylenediamine Tetra-Acetate. K. E. Langford. *Electroplating and Metal Finishing,* v. 7, Feb. 1954, p. 46-48.

Rapid and accurate volumetric method. 3 ref.

7640* Suitability of Various Copper (I) Chloride Solutions for Carbonmonoxide Absorption in Orsat Analysis. (German.) Hans Mertens. *Gas und Wasserfach,* v. 95, Ausgabe Gas, no. 3, Feb. 1, 1954, p. 79-83.

Measurements of absorption speeds of CO containing gases in three solutions by volumetric method. Diagram, tables. 9 ref.

7641 The Determination of Halogens in Complex Platinates: Preliminary Reduction With Hydrazine. W. Pugh. *Journal of Applied Chemistry,* v. 4, Jan. 1954, p. 47-48.

Determination of halogens in chloro- and bromo-platinates, which react incompletely with $AgNO_3$, is shown to be rendered simple and accurate by use of preliminary reduction with hydrazine hydrate, followed by precipitation with $AgNO_3$ and titration with thiocyanate. Table. 7 ref.

7642 The Assessment of Individual Sources of Error in the Combustion Method for the Determination of Sulphur

in Steel. I. Mild Steel. T. B. Smith, A. Backhouse, and P. Woodward. *Journal of Applied Chemistry*, v. 4, Feb. 1954, p. 75-82.

Includes diagram, tables. 14 ref.

7643* A Method for the Detection of Foreign Fats in Dairy Products. V. R. Bhalerao and F. A. Kummerow. *Journal of Dairy Science*, v. 37, Feb. 1954, p. 156-161.

Method detects admixtures of 10% or more of vegetable or animal fats with butter fat. Tables. 7 ref.

7644 Air-Cooled Electrodes for the Spectrochemical Analysis of Powders. B. J. Stallwood. *Optical Society of America, Journal*, v. 44, Feb. 1954, p. 171-176.

A controlled source of excitation eliminates selective volatilization and element interference effects encountered in spectrochemical analysis of powders with d.c. arc. Diagram, table, graphs, spectrogram. 7 ref.

7644a Natural Gasoline Analysis. S. T. Preston and Dan E. Smith. *Petroleum Refiner*, v. 33, Feb. 1954, p. 137-139.

Method analyzes liquid residues for vapor equivalent, molecular weight, and liquid to gas ratio. Diagrams, graph, photograph. 2 ref.

7645* Quantitative Inorganic Chromatography. IV. Chromatographic Separation of Some Acids and Salts on Alumina Impregnated Paper. (English.) Yoshinaga Oka and Akira Murata. *Science Reports of the Research Institutes, Tohoku University*, ser. A, v. 5, no. 4, Aug. 1953, p. 343-349.

Sulfates and nitrates of Cu, Zn, Cd, Pb, Mn, Ni, and Co were separated from H_2SO_4, HNO_3, and other salts. Chromatograms, diagrams, tables.

7646* Rapid Determination of Micro-Quantity of Silicon in Steels. (English.) Hidehiro Goto and Yachiyo Kakita. *Science Reports of the Research Institutes, Tohoku University*, ser. A, v. 5, no. 5, Oct. 1953, p. 395-404.

Silicon determined in 0.01% amounts by colorimertic methods using Mo yellow or Mo blue. Graphs, tables. 4 ref.

7647* The Determination of Small Amounts of Chromium in Textiles by Means of Diphenylcarbazide. A. G. Hamlin. *Textile Institute, Journal, Transactions*, v. 45, Jan. 1954, p. T44-T54.

Includes graphs, tables. 17 ref.

7648* Precipitation of Copper With Arsanilic Acid. (German.) A. Musil and R. Pietsch. *Zeitschrift für analytische Chemie*, v. 140, no. 6, 1953, p. 421-426.

Procedure shows final determination of Cu can be done titrimetrically or gravimetrically. Tables. 11 ref.

7649* Analytical Applications of Trithiocarbonic Acid. (German.) A. Musil and W. Pilz. *Zeitschrift für analytische Chemie*, v. 141, no. 1, 1954, p. 19-23.

Separation of Zn from Fe, Mn, and alkaline earths. Tables. 9 ref.

7650* Rapid Process of Determining Aluminum in Polynary Aluminum Bronzes. (German.) Hugo Wiedmann. *Zeitschrift für Metallkunde*, v. 44, no. 12, Dec. 1953, p. 565-566.

Procedure is described. Tables.

Books and Miscellaneous Publications

7651 Methods for Emission Spectrochemical Analysis. ASTM Committee E-2 on Emission Spectroscopy. 309 p. 1953. Amer. Society for Testing Materials, Philadelphia. (QD95 Am35m)

Methods are based on experience of submitters. Pertinent information for each method permits application in various laboratories with different types of equipment.

7652 (Paper Chromatography.) **Papierchromatographie.** Friedrich Cramer. 2nd Rev. Ed. 136 p. 1953. Verlag Chemie, GmbH., Weinheim/Bergstr., Germany. (QD271 C84p2)

Principles, application, evaluation, and procedure for analyzing different substances.

7653 Electroanalytical Chemistry. James J. Lingane. 448 p. 1953. Interscience Publishers, Inc., N. Y. (QD115 L64e)

Instrumentation, methodology, specific practical applications of controlled potential electrolysis, and theory of analytical methods based on e.m.f. and conductance measurements.

See also:

7557 (determination of Na_2O in glass by flame spectrophotometry)
7559 (titration of clay minerals)
8081 (infrared spectroscopy of coal)
8354 (analysis of high purity Fe)
8378 (production control in steel mill with ARL quantometer)

CHEMISTRY—ORGANIC

7654 A General Mechanism for Vitamin B_6-Catalyzed Reactions. David E. Metzler, Miyoshi Ikawa, and Esmond E. Snell. *American Chemical Society, Journal*, v. 76, Feb. 5, 1954, p. 648-652.

Many reactions of amino acids catalyzed by pyridoxal phosphate containing enzymes. Most of these enzymatic reactions have been duplicated by non-enzymatic model reactions in which pyridoxal or other appropriate aldehydes and a suitable metal serve as a catalyst. Table. 40 ref.

7655 Preparation of Secondary Amine Mustards With High Toxicity. Orrie M. Friedman and Arnold M. Seligman. *American Chemical Society, Journal*, v. 76, Feb. 5, 1954, p. 658-661.

Development of a type of secondary nitrogen mustard capable of intramolecular cyclization to the biologically potent tertiary amino state. 11 ref.

7656 Chemistry of the Aliphatic Esters of Phosphorothioic Acids. III. Alkoxide Cleavage of O,O,S-Trialkyl Phosphorodithioates. W. E. Bacon and W. M. LeSuer. *American Chemical Society, Journal*, v. 76, Feb. 5, 1954, p. 670-676.

A convenient sulfide synthesis. Tables. 16 ref.

7657 Some Nucleophilic Displacements on 3-Bromo-1,2-Epoxybutane and 1-Bromo-2,3-Epoxybutane. Russell C. Waters and Calvin A. Vander Werf. *American Chemical Society, Journal*, v. 76, Feb. 5, 1954, p. 709-713.

Investigation of reactions with sodium methoxide in methanol, sodium ethoxide in ethanol, and lithium aluminum hydride in ether. 29 ref.

7658 Epoxyethers. V. The Reaction of Perbenzoic Acid With Vinyl Ethers. Calvin L. Stevens and James Tazuma. **VI. A Triphenyl Substituted Epoxyether.** Calvin L. Stevens and Jacob J. DeYoung. *American Chemical Society, Journal*, v. 76, Feb. 5, 1954, p. 715-720.

Investigation resulted in isolation of a pure epoxyether from reaction of a vinyl ether with perbenzoic acid fully substituted with aromatic groups. 25 ref.

7659 Ionic Polymerization. Ion Pair Chain Mechanisms. The Effect of Different Lewis Acid Catalysts on the Monomer Reactivity Ratios in Copolymerization. C. G. Overberger, R. J. Ehrig, and David Tanner. *American Chemical Society, Journal*, v. 76, Feb. 5, 1954, p. 772-775.

Includes graph, tables. 15 ref.

7660 New Intramolecular Rearrangements of α-Chloroalkylsilicon Compounds. Leo H. Sommer, Donald L. Bailey, Jack R. Gould, and Frank C. Whitmore. *American Chemical Society, Journal*, v. 76, Feb. 5, 1954, p. 801-803.

Presented in part before Div. of Organic Chemistry, 113th Meeting, ACS, Chicago, Apr. 22, 1948. Three new examples of the intramolecular rearrangement of alkyl from Si to C have been found, demonstrating generality of phenomenon for organosilicon compounds. 11 ref.

7661 Mediation by Metals of the Binding of Small Molecules by Proteins. Irving M. Klotz and W.-C. Loh Ming. *American Chemical Society, Journal*, v. 76, Feb. 5, 1954, p. 805-814.

Includes graphs, diagrams, tables. 36 ref.

Chemistry—Organic

7662* Progress in Perfumery Materials. Paul Z. Bedoukian. *American Perfumer and Essential Oil Review*, v. 63, Feb. 1954, p. 101-106.

Comprehensive analysis of all developments in 1953. Photographs. 98 ref. (To be continued.)

7663* Chemistry and Technology of Silicones. (German.) Walter Noll. *Angewandte Chemie*, v. 66, no. 2, Jan. 21, 1954, p. 41-55.

Relations between chemistry, molecular structure, bonding forces, and technological properties. Application possibilities. Photographs, tables, graphs. 35 ref.

7664* Organic Derivatives of Clay Minerals. (German.) H. Deuel. *Berichte der deutschen keramischen Gesellschaft*, v. 31, no. 1, Jan. 1954, p. 1-7.

Reactions with organic reagents are possible because of small size and deflectiveness of the crystals and probable presence of SiOH groups. Study and literature review on properties of minerals and chemical constitution of their surfaces. Tables. 45 ref.

7665 Preparation of Ion-Exchange Resins. I. H. Spinner, J. Ciric, and W. F. Graydon. *Canadian Journal of Chemistry*, v. 32, Feb. 1954, v. 32, Feb. 1954, p. 143-152.

Ion-exchange resins as membranes and in granular form were prepared by copolymerization of divinyl benzene with various esters of *p*-styrene sulphonic acid and subsequent hydrolysis. Tables, graphs. 11 ref.

7666 The Chemistry of the Pechmann Dyes. Erwin Klingsberg. *Chemical Reviews*, v. 54, Feb. 1954, p. 59-77.

Includes tables, graphs, diagram, infra-red spectra. 39 ref.

7667* Catalytic Separation of Hydrogen on the Mercury Drop Electrode Induced by Certain Azines, Oxazines, and Thiazines. (German.) V. Vojír. *Collection of Czechoslovak Chemical Communications*, v. 18, no. 5, Oct. 1953, p. 629-631.

A catalytic effect detected in methylene blue, thionine, gallocyanine, and neutral red. Graphs.

7668* Reactivity of Methyl Groups on Heterocyclic Nuclei. III. The Methiodide of 2-(β-Phenyl-β-hydroxyethyl) Pyridine and Its Reactions; a Synthesis of *dl*-Sedamine. (Russian.) Ia. Stanek, Ia. Gebki, and V. Zverzhina. *Collection of Czechoslovak Chemical Communications*, v. 18, no. 5, Oct. 1953, p. 679-683.

11 ref.

7669* Complex of Aluminum Chloride with Sulfuric Acid as a Catalyst for the Alkylation of Isopentane by Isopropylene and Tertiary Butylchloride. (Russian.) A. V. Topchiev, L. N. Andreev, and B. A. Krentsel. *Doklady Akademii Nauk SSSR*, v. 92, no. 3, Sept. 21, 1953, p. 577-580.

Possibility for alkylation of paraffin hydrocarbons. Results discussed. Tables, graphs. 6 ref.

7670* Movability of Halogen in the Naphthalene Nucleus. (Russian.) V. N. Ufimtsev and M. M. Manachkina. *Doklady Akademii Nauk SSSR*, v. 92, no. 3, Sept. 21, 1953, p. 581-584.

Fourteen nitro-bromo-naphthalenes synthesized and investigated in temperature range from 25 to 200 C from 1 to 5 hr. Tables, graphs. 10 ref.

7671* Synthesis of Aminophosphine and Aminothiophosphine Esters. (Russian.) A. N. Pudovik. *Doklady Akademii Nauk SSSR*, v. 92, no. 4, Oct. 1, 1953, p. 773-776.

Not only dialkyl phosphorous acids, but acid esters of alkyl- and aryl-phosphinic and of thiophosphoric acids in presence of alcoholates or alkali metals can be joined to different imines easily. Tables.

7672* Synthesis of Esters of α-Aminoalkylthiophosphinic Acids. (Russian.) M. I. Kabachnik, T. Ia. Medved, and T. A. Mastriukova. *Doklady Akademii Nauk SSSR*, v. 92, no. 5, Oct. 11, 1953, p. 959-962.

Compounds synthesized by reaction of dialkyl thiophosphites with NH_3 and aldehydes or ketones. Constants and results of analysis and method of experimental investigation. Tables. 8 ref.

7673* Silicones in Cosmetics. E. G. Tajkowsky and T. H. Reilly. *Drug and Cosmetic Industry*, v. 74, Feb. 1954, p. 190-191, 282-283.

Properties and applications of fluid silicones of interest in the toilet goods industry. Formulas.

7674 Synthesis of Dodecylbenzene. M. L. Sharrah and Geo. C. Feighner. *Industrial and Engineering Chemistry*, v. 46, Feb. 1954, p. 248-254.

$AlCl_3$, HF, and H_2SO_4 as catalysts in preparation of dodecyl benzene from benzene and propene tetramer. Infra-red spectrograms, tables, graphs. 6 ref.

7675 Pyrolysis of C_2 and C_3 Hydrocarbons. R. E. Kinney and D. J. Crowley. *Industrial and Engineering Chemistry*, v. 46, Feb. 1954, p. 258-264.

Investigation of pyrolysis of ethylene, ethane, propylene, and propane at a single temperature, over the same contact time range for each hydrocarbon. Diagrams, graphs, tables. 11 ref.

7676 Sodium Methylsiliconate. William S. Kather and Arnold Torkelson. *Industrial and Engineering Chemistry*, v. 46, Feb. 1954, p. 381-384.

Preparation, reactions, and applications. Photograph, tables, graphs. 26 ref.

7677* Studies in the Higher Coal-Tar Bases. Hugh B. Nisbet and A. M. Pryde. *Institute of Fuel, Journal*, v. 27, Feb. 1954, p. 58-66.

Nitrogenous bases extracted by H_2SO_4 from naphthalene- and benzol-absorbing oil fractions of vertical-retort coal tar were subjected to a series of fractional distillations. From the narrow boiling-range cuts, bases were isolated and characterized. Graphs, tables.

7678* The Synthesis and Properties of Tertiary Methanes. Frederick Challenger and Donald A. Pantony. *Institute of Petroleum, Journal*, v. 40, Feb. 1954, p. 37-44.

Includes tables. 35 ref.

7679* Ion Exchange Resins in Hydrocarbons. Andrew Gemant. *Institute of Petroleum, Journal*, v. 40, Feb. 1954, p. 50-54.

Radioactive tracer technique to study action of synthetic ion exchange resins on organic ions in hydrocarbons, including oils. Tables, graphs. 7 ref.

7680 Composition of Coal Tars. D. McNeil and G. A. Vaughan. *Institution of Gas Engineers, Copyright Publication no.* 438, 1953, 23 p. (TP700 In7.3c)

Scheme of analysis gives amounts of practically all commercially important constituents. Application of method to 12 British coal tars and to tar obtained as by-product in carbonization of West Midlands coal. Diagrams, tables. 5 ref.

7681 Bromination of Hydrocarbons. VII. Bromination of Isobutane. Bond Dissociation Energies from Bromination Kineties. Bernard H. Eckstein, Harold A. Scheraga, and Ervin R. Van Artsdalen. *Journal of Chemical Physics*, v. 22, Jan. 1954, p. 28-35.

Carbon-hydrogen bond dissociation energies and enthalpies of formation were determined. Tables, graphs. 22 ref.

7682* A Rotating Combustion Bomb for Precision Calorimetry. Heats of Combustion of Some Sulfur-Containing Compounds. Ward N. Hubbard, Charles Katz, and Guy Waddington. *Journal of Physical Chemistry*, v. 58, Feb. 1954, p. 142-152.

To obtain accurate heat of formation, calorimeter was developed which permits rotating bomb after combustion. Diagrams, tables. 15 ref.

7683* Heat Capacity, Heats of Transitions, Fusion, and Vaporization, and Vapor Pressure of Octafluorocyclobutane. George T. Furukawa, Robert E. McCoskey, and Martin L. Reilly. *Journal of Research, National Bureau of Standards*, v. 52, Jan. 1954, p. 11-16.

Material, apparatus, method, and experimental results. Tables, graphs. 22 ref.

7684* Ion Exchangers. III. Naphthalene Sulphonic Acid-Formaldehyde Resins. S. L. Bafna and H. A. Shah. *Journal of Scientific & Industrial Research*, v. 13, sec. B, Jan. 1954, p. 51-52.

Cation exchangers obtained by condensation have high capacity; ionogenic groups are of sulphonic and carboxylic types. Graph, table. 15 ref.

7685* Verification of Structure of Aromatic Thiolsulfonic Esters by Chemical Method. (Hungarian.) Elemér Vinkler and Ferenc Klivényi. *Magyar Kémiai Folyóirat*, v. 60, no. 1, Jan. 1954, p. 13-20.

Reduction of thiolsulfonates by an amount of Zn and acid equivalent to two atoms of H led to scission of S-S bond. Tables. 12 ref.

7686* Synthesis of Macromolecules of Uniform Size. (German.) W. Kern and W. Thoma. *Makromolekulare Chemie*, v. 11, no. 1, Oct. 1953, p. 10-23.

Methods of preparation. Tables, photomicrographs. 17 ref.

7687* The Adsorptivity of Water-Soluble Polymer Compounds, Especially of Polyvinyl Pyrrolidone. (German.) W. Scholtan. *Makromolekulare Chemie*, v. 11, nos. 2-3, Dec. 1953, p. 131-230.

Adsorptive capacity of water-soluble polymers quantitatively examined with special reference to dyes by distribution method, dialysis, and electrophoresis. Tables, graphs, spectrograms.

7688 Synthesis of Petrochemicals. VII. Everett E. Gilbert. *Petroleum Engineer*, v. 26, Feb. 1954, p. C21 + 5 pages.

Sulfonation of aromatic hydrocarbons as major petrochemical tool. Photographs, tables. 18 ref.

7689 The Use of Small-Scale Fractionation Techniques for Characterization of Complex Organic Compounds. Lyman C. Craig. *Record of Chemical Progress*, v. 14, no. 4, 1953, p. 177-189.

Includes photograph, graphs, diagrams. 10 ref.

7690* Synthesis, Refractometric Constants, and Some Other Physical Properties of a Homologous Series of Branched Alkenes. (English.) J. P. Schuhmacher and J. P. Wibaut. *Recueil des travaux chimiques des Pays-Bas*, v. 72, no. 11, Nov. 1953, p. 1037-1075.

Preparation of 11 terms of the homologous series of the 2-methyl-1-alkenes. Graphs, tables. 21 ref.

7691* Steric Effects on Mesomerism. XII. On the Effective Size of Methyl(ene) Groups, Especially in Ortho-Xylene Derivatives. (English.) R. van Helden, P. E. Verkade, and B. M. Wepster. *Recueil des travaux chimiques des Pays-Bas*, v. 73, no. 1, Jan. 1954, p. 39-59.

Phenomenon investigated with aid of deacylation rates, ultraviolet absorption spectra, molecular refractions, and basic strengths. Tables, graphs. 36 ref.

7692* Copolymerization of Drying Oils. (English.) C. Boelhouwer, Liem Tjing Tien, and H. I. Waterman. *Recueil des travaux chimiques des Pays-Bas*, v. 73, no. 2, Feb. 1954, p. 143-149.

Unsaturated hydrocarbons prepared from methyl esters of stearic, oleic, linoleic, and linolenic acid, and from linseed oil fatty acid methyl esters by replacing ester group with alkene group. Tables. 20 ref.

7693 The Cross-Linking and Degradation of Paraffin Chains by High-Energy Radiation. A. Charlesby. *Royal Society, Proceedings*, v. 222, ser. A, Feb. 23, 1954, p. 60-74.

n-Paraffins from C_7H_{16} to $C_{36}H_{74}$ and polyethylene polymers (Polythene and Winnothene) were subjected to atomic pile radiation. Importance of results, as far as polymerization theory is concerned. Tables, graphs. 9 ref.

7694 Low-Temperature Oxidation and Cool Flames of Propane. J. H. Knox and R. G. W. Norrish. *Royal Society, Proceedings*, v. 221, ser. A, Jan. 21, 1954, p. 151-170.

Experiments use a continuous-flow technique with a view to further elucidation of the mechanism of low-temperature oxidation of hydrocarbons. Tables, graphs. 23 ref.

7695* Experiments on the Chemistry of Anthraquinone Derivatives. W. Bradley. *Society of Dyers and Colourists, Journal*, v. 70, Feb. 1954, p. 57-62; disc., p. 62-63.

Studies on anthraquinone vat dyes. 21 ref.

7696* Starch and Its Derivatives. Their Role in Britain's Economy. John Beck. *Times Review of Industry*, v. 8, new ser., Feb. 1954, p. 10-11.

Iron foundries, textile mills, oil wells, tanneries, pottery, and penicillin are all affected by this product. Photographs, table.

7697* Interaction of Alkyl Chlorides With Paraffin and Aromatic Hydrocarbons. (Russian.) A. V. Topchiev, B. A. Krentsel, and L. N. Andreev. *Uspekhi Khimii*, v. 23, no. 1, 1954, p. 27-44.

Alkyl chlorides alkylate well with aromatic hydrocarbons in presence of $AlCl_3$. Graphs, tables. 63 ref.

7698* Synthesis of Steroid Compounds and Their Related Substances. XXVII. Condensation of Cyclic β-Diketones With Vinylketones and Conversion of the Products. Pt. 2. (Russian.) I. N. Nazarov and S. I. Zabialov. *Zhurnal Obshchei Khimmi*, v. 23 (85), no. 10, Oct. 1953, p. 1703-1712. 9 ref.

Books and Miscellaneous Publications

7699* Toxicity of Industrial Organic Solvents. Ethel Browning. 2nd Ed. 411 p. 1953. Chemical Publishing Co., N. Y. (Ra1235 B82t2)

Possibility that volatile substances, used industrially as solvents and often in enormous quantities, might injure the health of workers. Chapters cover hydrocarbons; chlorinated hydrocarbons; alcohols; ethers; esters; ketones; glycols and their derivatives; amines and coal tar bases; and nitro and miscellaneous compounds.

7700 Advances in Carbohydrate Chemistry. Claude S. Hudson, Melville L. Wolfrom, Stanley Peat, Maurice Stacey, and E. L. Hirst, editors. v. VIII. 408 p. 1953. Academic Press, Inc., N. Y. (QD321 A95)

Includes "Relative Reactivities of Hydroxyl Groups of Carbohydrates", James M. Sugihara; "The Chemistry of the 2-Desoxysugars", W. G. Overend; "Sulfonic Esters of Carbohydrates", R. Stuart Tipson; "The Methyl Ethers of *D*- Mannose", G. O. Aspinall; "The Chemical Synthesis of *D*-Glucuronic Acid", C. L. Mehltretter; "*D*-Glucuronic Acid in Metabolism", H. G. Bray; "The Substituted-Source Structure of Melezitose", Edward J. Hehre; "Composition of Cane Juice and Cane Final Molasses", W. W. Binkley and M. L. Wolfrom; and "Seaweed Polysaccharides", T. Mori.

7701 Imidazole and Its Derivatives. Klaus Hofmann. Part I. The Chemistry of Heterocyclic Compounds. 447 p. 1953. Interscience Publishers, Inc., N. Y. (QD401 H67i)

Chemistry of classes and derivatives; and a systematic survey and bibliography.

7702 Silicones and Their Uses. Rob Roy McGregor. 302 p. 1954. McGraw-Hill. (QD412.S6 M17s)

Contains, in non-technical language, an over-all picture of silicones and their uses.

7703 Organic Crystals and Molecules. J. Monteath Robertson. 340 p. 1953. Cornell Univ. Press, Ithaca, N. Y. (QD921 R540)

Theory of X-ray structure analysis with applications to organic chemistry.

See also:

7595 (petrochemical reactions)
8069 (mechanism of fat oxidation)
8080 (paraffin hydrocarbons)
8147 (chemistry of phthalocyanines)
8950 (chemistry in textile industry)

CHEMISTRY—PHYSICAL

7704 Magnetochemistry of Technetium and Rhenium. C. M. Nelson, G. E. Boyd, and Wm. T. Smith, Jr. *American Chemical Society, Journal*, v. 76, Jan. 20, 1954, p. 348-352.

Magnetic susceptibility apparatus constructed and Faraday

Chemistry—Physical

method employed to make measurements on small quantities of Tc and Re from 78 to 410 K. Diagram, tables. 30 ref.

7705 Relative Rates of Iodination of *p*-Alkylphenols. Ernst Berliner, Frances Berliner, and Irina Nelidow. *American Chemical Society, Journal,* v. 76, Jan. 20, 1954, p. 507-509.

Rates in several aqueous solvents. Effects of alkyl groups on meta position. Tables. 19 ref.

7706 Factors Influencing the Oxidation of Phenols, Catalyzed by Zinc Oxide and Light. M. Clare Markham, M. Consilia Hannan, and S. W. Evans. *American Chemical Society, Journal,* v. 76, Feb. 5, 1954, p. 820-823.

Rates of formation of peroxides under varying conditions of concentration of various phenols, temperature, and light-intensity in aerated aqueous suspensions of ZnO in ultraviolet light at 3650 A. Graphs. 7 ref.

7707 The Kinetics of the Base-Catalyzed Deuterium Exchange of Chloroform in Aqueous Solution. Jack Hine, Roy C. Peek, Jr., and Billy D. Oakes. *American Chemical Society, Journal,* v. 76, Feb. 5, 1954, p. 827-829.

Kinetics of reaction of deutero chloroform with NaOH in homogeneous aqueous solution were studied by infra-red measurements of isotopic content of the haloform. Rate constants at 0, 20.1, and 35 C and values of heat and entropy of activation. 8 ref.

7708 Nickel, Copper and Some of Their Alloys as Catalysts for Ethylene Hydrogenation. Richard J. Best and W. Walker Russell. *American Chemical Society, Journal,* v. 76, Feb. 5, 1954, p. 838-842.

Activity of reduced unsupported precipitated or co-precipitated carbonates of Ni and/or Cu for hydrogenation of ethylene. Surface areas and lattice constants of catalysts. Results find adequate explanation in terms of known electronic structure of Ni-Cu system. Graphs. 18 ref.

7709 Densities and Optical Properties of Organic Compounds in the Liquid State. III. The Densities of Aliphatic Hydrocarbons. IV. The Densities of α-Substituted Normal Alkanes. V. The Densities of Esters From Fatty Acids and Normal Alcohols. Maurice L. Huggins. *American Chemical Society, Journal,* v. 76, Feb. 5, 1954, p. 843-850.

Includes tables, graphs. 17 ref.

7710 Electrophilic Displacement Reactions. III. Kinetics of the Reaction Between Hydrogen Peroxide and Benzeneboronic Acid. Henry G. Kuivila. *American Chemical Society, Journal,* v. 76, Feb. 5, 1954, p. 870-874.

Kinetics and mechanisms of reactions. Graphs, tables. 15 ref.

7711 Rapid Exchange Between Iodine and Stannic Iodide in Carbon Tetrachloride at 0°. Milton Kahn and Arthur J. Freedman. *American Chemical Society, Journal,* v. 76, Feb. 5, 1954, p. 929-930.

Deals with rapid exchange at 0 C in presence of a dark red light. Table. 6 ref.

7712 Specific Effects in Acid Catalysis by Ion Exchange Resins. III. Some Observations on the Effect of Polyvalent Cations. Sidney A. Bernhard, Eugene Garfield, and Louis P. Hammett. **IV. The Effect of Quaternary Ammonium Ions on the Hydrolysis of Esters of Related Structure.** Peter Riesz and Louis P. Hammett. *American Chemical Society, Journal,* v. 76, Feb. 20, 1954, p. 991-994.

Includes tables, graph. 11 ref.

7713 The Infrared Spectra of Stable Pentaborane and Deuterated Pentaborane. Henry J. Hrostowski and George C. Pimentel. *American Chemical Society, Journal,* v. 76, Feb. 20, 1954, p. 998-1003.

Consideration of B isotopic band structure and frequency shift on deuteration permits identification of vibrational modes of several fundamentals. Tables, infra-red spectra. 9 ref.

7714 The Quaternary System CaO-Al_2O_3-TiO_2-SiO_2. II. The Ternary System Calcium Metasilicate-Sphene-Silica. III. The Quaternary System Calcium Metasilicate-Anorthite-Sphene-Silica. Y. M. Agamawi and J. White. *British Ceramic Society, Transactions,* v. 53, Jan. 1954, p. 1-38.

Includes tables, graphs, phase diagrams. 21 ref.

7715 Calculation of Solubility of Calcite in Aqueous Solutions. E. B. Shternina. *Henry Brutcher, Altadena, Calif., Translation no.* 3182, 8 p. (From *Doklady Akademii Nauk SSSR,* v. 50, 1954, p. 261-264.)

Application of quantitative thermodynamics and modern solution theory to construction of solubility diagrams. Tables, graph. 9 ref.

7716 Study of Process of Growth of Carbon-Black Particles With the Aid of the Electron Microscope. P. A. Tesner and A. I. Echeistova. *Henry Brutcher, Altadena, Calif., Translation no.* 3222, 7 p. (From *Doklady Akademii Nauk SSSR,* v. 87, no. 6, 1952, p. 1029-1031.)

Data on absolute rates and apparent activation energies during decomposition of methane, benzene, and cyclohexane. Graphs, electron micrographs. 6 ref.

7717 Temperature Coefficients for Self-Diffusion in Solution. C. J. Krauss and J. W. T. Spinks. *Canadian Journal of Chemistry,* v. 32, Feb. 1954, p. 71-78.

Coefficients of self-diffusion for 1 to 10^{-4} molar aqueous solutions of sodium dihydrogen phosphates at temperatures of 15, 25, 35, 45 C. Tables, graphs. 19 ref.

7718 The Photolysis of Mercury Dimethyl with Deuterium. Richard E. Rebbert and E. W. R. Steacie. *Canadian Journal of Chemistry,* v. 32, Feb. 1954, p. 113-116.

Results of experimental studies. Graph, table. 7 ref.

7719 Hydrogen Peroxide: The Low Temperature Heat Capacity of the Solid and the Third Law Entropy. Paul A. Giguère, I. D. Liu, J. S. Dugdale, and J. A. Morrison. *Canadian Journal of Chemistry,* v. 32, Feb. 1954, p. 117-128.

Apparatus, methods, and results of experimental studies. Diagram, tables, graphs. 29 ref.

7720 Calculation of Electron Trap Depths From Thermoluminescence Maxima. A. H. Booth. *Canadian Journal of Chemistry,* v. 32, Feb. 1954, p. 214-215.

4 ref.

7721 The Chemistry of Bleaching and Oxidizing Agents. Gustaf Holst. *Chemical Reviews,* v. 54, Feb. 1954, p. 169-194.

Includes diagrams, graphs, tables. 58 ref.

7722* Surface and Thermodynamic Activity of Sulfur in Iron-Carbon-Sulfur Alloys. (French.) Paul Kozakevitch, Georges Urbain, and Max Sage. *Comptes rendus,* v. 237, no. 25, Dec. 21, 1953, p. 1690-1692.

Includes graph. 3 ref.

7723* Diffusion of K^{42}, Rb^{86}, Ag^{110} in NaCl Crystals. (French.) Marius Chemia. *Comptes rendus,* v. 238, no. 1, Jan. 4, 1954, p. 82-84.

Coefficient was measured at temperatures from 600 to 750 C. Graph, table. 5 ref.

7724* Formation of Chlorobromoiodides of Germanium Detected by Raman Effect When Tetrachloride, Tetrabromide, and Tetraiodide of Germanium are Mixed. (French.) Marie-Louise Delwaulle. *Comptes rendus,* v. 238, no. 1, Jan. 4, 1954, p. 84-86.

Includes graphs. 3 ref.

7725* Photochemical Transformation of F-Centers in Crystals of KCl at High Temperatures. (Russian.) A. A. Shatalov. *Doklady Akademii Nauk SSSR,* v. 92, no. 3, Sept. 21, 1953, p. 549-552.

Experimental work demonstrates formation of bell-shaped adsorption band called "X-band" as a result of action of light at temperatures around 300 C. Graphs. 9 ref.

7726* Isotopic Exchange of Oxygen in Solutions of Acids of Phosphorus. (Russian.) A. I. Brodskii and L. V. Sulima. *Doklady Akademii Nauk SSSR,* v. 92, no. 3, Sept. 21, 1953, p. 589-592.

Shows rate of oxygen exchange in acids is many times greater than in their salts. Table, graphs. 9 ref.

7727* Influence of the Structure of Alkyliodides on the Rate of Their Isotopic Exchange With Ions and Atoms of Iodine. (Russian.) M. B. Neiman, B. A. Kuznetsov, and Iu. M. Shapovalov. *Doklady Akademii Nauk SSSR*, v. 92, no. 3, Sept. 21, 1953, p. 611-614.

Reactions in solutions proceed either by ion or radical-chain mechanisms. Mechanism of process determines direction of reaction. Diagram, tables, graphs. 13 ref.

7728* Sorption Properties of Roasted Equimolecular Mixtures CaO-ZrO_2 and MgO-ZrO_2. (Russian.) E. N. Nikitin. *Doklady Akademii Nauk SSSR*, v. 92, no. 3, Sept. 21, 1953, p. 617-620.

Roasting was done at temperatures up to 1200 C in an electric furnace for one hr. Sorption vapors were those of ethyl alcohol at 20 C and nitrogen at −196 C. Graphs. 6 ref.

7729* Problem of Reduction of a Nitrate Ion on a Mercury Drop Cathode. (Russian.) A. N. Frumkin and S. I. Zhdanov. *Doklady Akademii Nauk SSSR*, v. 92, no. 3, Sept. 21, 1953, p. 629-632.

Experiments show nitrate ion reduced more readily in presence of an excess of a foreign electrolyte with higher cation valence. Graphs. 12 ref.

7730* Alkylation of Benzene by Alcohols and Simple Esters in the Gaseous Phase. (Russian.) N. I. Shuikin, A. B. Kuchkarev, and N. A. Pozdniak. *Doklady Akademii Nauk SSSSR*, v. 92, no. 4, Oct. 1, 1953, p. 785-788.

Alkylation of benzene by different aliphatic alcohols and simple esters in contact with $ZnCl_2$ adsorbed by Al_2O_3 at atmosphere pressure. Graphs. 5 ref.

7731* Investigation of Ultrasound Absorption by a Series of Saturated Hydrocarbons Using the Impulse Method. (Russian.) N. I. Koshkin and V. F. Nozdrev. *Doklady Akademii Nauk SSSR*, v. 92, no. 4, Oct. 1, 1953, p. 793-796.

Investigations in temperature range −60 to 50 C on N-hexane, N-heptane, and N-octane using frequencies of 11.96 and 15.10 Mc.

7732* Intercrystalline Films in Multicrystal Alkaline-Halide Salts and Some of Their Properties. (Russian.) L. M. Shamovskii and L. M. Rodionova. *Doklady Akademii Nauk SSSR*, v. 92, no. 5, Oct. 11, 1953, p. 939-942.

Investigation concludes that new centers of coloring which arise in a crystallophosphor are caused by localization of electrons in the activator located on intercrystalline surfaces. Diagram. 9 ref.

7733* Influence of Surface-Active Compounds on the Penetration of Hydrogen Into Iron and the Mechanism of Hydrogen Overpotential. (Russian.) I. A. Bagotskaia and A. N. Frumkin. *Doklady Akademii Nauk SSSR*, v. 92, no. 5, Oct. 11, 1953, p. 979-982.

Transmission of H overpotential through Fe membrane. Method and installation are described. Diagram, graphs. 11 ref.

7734* Continuous Chromathermography. (Russian.) A. A. Zhukhovitskii, N. M. Turkel'taub, and T. V. Georgievskaia. *Doklady Akademii, Nauk SSSR*, v. 92, no. 5, Oct. 11, 1953, p. 987-990.

New variation of adsorption analysis, theoretical bases, operating technique, and field of application. A series of examples illustrate practical utilization. Graphs.

7735* General Principles of Magnetochemistry. Application to Study of Structures. (French.) A. Pacault. *Experientia*, v. 10, no. 2, Feb. 15, 1954, p. 41-59.

Magnetic units of isotropic substances; apparatus for measuring magnetic susceptibilities; and electronic delocalization in aromatic molecules. Diagrams, graphs, photographs, tables. 79 ref.

7736 The Ionization of Organic Halides in Nitroalkanes. Alwyn G. Evans, J. A. G. Jones, and G. O. Osborne. *Faraday Society, Transactions*, v. 50, Jan. 1954, p. 16-23.

Thermodynamics of equilibrium $RCl_{(s)} \rightleftarrows R^+Cl^-_{(s)}$ in nitromethane have been studied for various R groups. Graphs, table. 11 ref.

7737* On Some Dielectric Properties of a Few Solids Having "Hydrogen Bond" in Their Structures. Hideo Futaba. *Hokkaido University, Faculty of Science, Journal*, ser. II., v. 4, Nov. 1953, p. 217-227.

Dielectric constants of boric acid (pressed powder), oxalic acid, and dihydrate (single crystal) were measured in an alternating field at 3 x 10^6 cycles per sec. Diagrams, graphs. 6 ref.

7738* On the Activation Energy of Photographic Chemical Development. Shintaro Sugai and Jiro Furuichi. *Hokkaido University, Faculty of Science, Journal*, ser. II, v. 4, Nov. 1953, p. 253-267.

Activation energies of phenomena measured using various dry plates. Results used to discuss mechanism of reaction. Graphs, tables, diagram. 21 ref.

7739* Nuclear Oxidation in Flavones and Related Compounds. XLVI. Synthesis in the Primetin Series. V. K. Ahluwalia, D. S. Gupta, V. V. S. Murti, and T. R. Seshadri. *Indian Academy of Sciences, Proceedings*, v. 38, sec. A, Dec. 1953, p. 480-494.

Experimental procedure and results. 10 ref.

7740 Vapor-Liquid Equilibria at 200 Mm. of Mercury. S. H. Ward and Matthew Van Winkle. *Industrial and Engineering Chemistry*, v. 46, Feb. 1954, p. 338-350.

Binary and tenary experimental vapor-liquid equilibrium data determined on systems composed of higher boiling hydrocarbons, naphthalene-*n*-tetradecane-1-hexadecene. Graphs, diagrams, tables. 17 ref.

7741 Equilibrium Data for Silica Gel and Water Vapor. Stephen S. Hubard. *Industrial and Engineering Chemistry*, v. 46, Feb. 1954, p. 356-358.

Includes graphs, table. 4 ref.

7742 The Experimental Study of Chemical Reactions Between Solids. Alex P. Rice. *Industrial Chemist and Chemical Manufacturer*, v. 30, Feb. 1954, p. 60-66.

Last of four articles reviewing subject; outlines a formal kinetic treatment for simpler reactions systems; experimental methods. Graphs, table. 21 ref.

7743* Localization of Hydrogen Atoms in Crystalline Structures. (French.) E. Grison. *Journal de chimie physique*, v. 50, nos. 11-12, Nov.-Dec. 1953, p. D59-D63; disc., p. D63-D64.

Results of X-ray analysis. Diagrams. 10 ref.

7744 A Modification of Trouton's Rule. S. T. Bowden. *Journal of Applied Chemistry*, v. 4, Jan. 1954, p. 38-41.

Trouton's rule is modified to allow for the fact that entropy of vaporization is generally a function of Guldberg ratio and the parachor–critical volume ratio. Tables. 14 ref.

7745 The Physical Toxicity of Chemicals. IV. Solubilities, Partition Coefficients and Physical Toxicities. J. C. McGowan. *Journal of Applied Chemistry*, v. 4, Jan. 1954, p. 41-47.

The 'hole' theory of solubility was used for calculation of partition coefficients between organic solvents and water, and of solubilities in water. Tables. 27 ref.

7746 The Analysis and Purification of Rare Gases by Means of Electric Discharges. R. Riesz and G. H. Dieke. *Journal of Applied Physics*, v. 25, Feb. 1954, p. 196-201.

Cataphoresis in gas discharges used in purification of rare gases for removal of traces of one rare gas from another. Graphs, diagrams. 5 ref.

7747 Paramagnetic Resonance Absorption in Solutions of K and Na in Liquid NH_3. Clyde A. Hutchinson, Jr. and Ricardo C. Pastor. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 1959-1971.

Resonance was studied at a frequency of approximately 7.0 x 10^6 cycle per sec. in a magnetic field of 2.5 gauss. Measurements were made at 240, 274, and 298 K and over a concentration range from 0.004 to 0.7 M. Tables, graphs. 30 ref.

Chemistry—Physical

7748 Temperature Gradients in Reacting Systems. Sidney W. Benson. *Journal of Chemical Physics*, v. 22, Jan. 1954, p. 46-50.
Heat conduction equation for reactions going on in a spherical flask leads to calculation of three parameters. 8 ref.

7749 Radiation—Induced Reaction Between Iodine and Heptane. Paul F. Forsyth, Edward N. Weber, and Robert H. Schuler. *Journal of Chemical Physics*, v. 22, Jan. 1954, p. 66-70.
Radiation-induced reaction studied with a view to its use in quantitative determination of free radical production in radiolysis of liquid hydrocarbons. Graphs, tables. 14 ref.

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Effects of adjacent radiating and absorbing regions at different temperatures and of spectral line shape, coupled with varying degrees of self-absorpiton. Graphs, tables. 6 ref.

7751 A New Method for the Measurement of Aerosol Electrification. B. L. Hinkle, Clyde Orr, Jr., and J. M. Dalla-Valle. *Journal of Colloid Science*, v. 9, Feb. 1954, p. 70-80.
Apparatus and techniques. Diagram, photograph, graph, tables. 19 ref.

7752 The Vibrational Spectra and Structure of Solid Hydroxylamine and Deutero-Hydroxylamine. R. E. Nightingale and E. L. Wagner. *Journal of Chemical Physics*, v. 22, Feb. 1954, p. 203-208.
Infrared spectra of thin films of H_2NOH and D_2NOD were obtained at −78 and −190 C in the region 4000 to 500 cm^{-1}. Tables, graphs. 19 ref.

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Electrical charging of conductive and dielectric spherical particles. Diagram, tables, graphs. 12 ref.

7754 The Theory of Defect Concentration in Crystals. G. H. Vineyard and G. J. Dienes. *Physical Review*, v. 93, ser. 2, Jan. 15, 1954, p. 265-268.
Theory of formation of vacancy and interstitial defects in crystals is re-examined. 11 ref.

7755 The Dielectric Relaxation of Polar Molecules in Solution. Nora E. Hill. *Physical Society, Proceedings*, v. 67, no. 410B, Feb. 1954, p. 149-158.
Simple theory of dielectric relaxation based on the same model of a liquid as Andrade's theory of viscosity. Tables, graphs. 17 ref.

7756* Phase Equilibria for Mixtures of Carbon Dioxide and Several Normal Saturated Hydrocarbons. W. C. Stewart and R. F. Nielsen. *Producers Monthly*, v. 18, Jan. 1954, p. 27-32.
Solubility of CO_2 in *n*-octane, *n*-decane, *n*-dodecane, *n*-tetradecane, and *n*-hexadecane at 60 and 90 F measured over the entire composition range. Trends in degree of CO_2 miscibility with increasing molecular weight of the hydrocarbon and with nature of hydrocarbon mixture are discussed. Use of "equilibrium constants" for phase calculations involving three phases is illustrated. Graphs, tables, diagram. 12 ref.

7757* The Influence of the Refractive Index on the Absorption of Light by Solutions. (English.) J. Schuyer. *Recueil des travaux chimiques des Pays-Bas*, v. 72, no. 11, Nov. 1953, p. 933-949.
New formula by which influence of refractive index on molar extinction coefficient of a solution can be calculated. Tables, graphs. 10 ref.

7758* The Exchange of Chromium Between Chromium (II) and Chromium (III) Ions. (English.) H. Van Der Straaten and A. H. W. Aten, Jr. *Recueil des travaux chimiques des Pays-Bas*, v. 73, no. 2, Feb. 1954, p. 89-94.
Rapid exchange of radioactive Cr was observed. Table. 5 ref.

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Apparatus and results. Graphs, diagrams. 9 ref.

7760* Catalysis Research on Alloys. XV. Hydrogenating Activity and Surface Size of Pulverized Ni-, Co-, Fe-, and Cu- Catalysts and Mixed Catalysts. (German.) G. Rienäcker and S. Unger. *Zeitschrift für anorganische und allgemeine Chemie*, v. 274, nos. 1-3, Dec. 1953, p. 47-71.
Experiments on catalytic effect of powders and powder mixtures. Diagrams, graphs, tables. 29 ref.

7761* On the Blocking-Layer Photoeffect on Sensitizing Dyes. (German.) W. Noddack and H. Meier. *Zeitschrift für Elektrochemie*, v. 57, no. 8, 1953, p. 691-696.
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7762* The Kinetics of Ion Exchange in Resin Ion Exchangers. (German.) G. Dickel and A. Meyer. *Zeitschrift für Elektrochemie*, v. 57, no. 10, 1953, p. 901-908.
Describes and evaluates experiments. Tables, graphs, diagram. 5 ref.

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Results are discussed on basis of Maxwell-Wagner theory. Graphs, tables, diagrams. 12 ref.

Books and Miscellaneous Publications

7764 Foams: Theory and Industrial Applications. J. J. Bikerman. 347 p. 1953. Reinhold Publishing Corp., N. Y. (QC183 B48f)
Fundamental knowledge of foams with their applications and inhibitions.

7765 Quantum Chemistry. Kenneth S. Pitzer. 525 p. 1953. Prentice Hall, Inc., N. Y. (QC174.1 P68q)
Includes fields of mechanics, thermodynamics, statistical mechanics, spectroscopy, electricity, and magnetism. Meets the needs of typical physical chemists with general background in calculus, physics, and thermodynamics.

See also:
7618 (electrochromatographic sequences)
7703 (organic crystals and molecules—book)
8154 (radioactive ion exchange)
8163 (light scattering by suspensions)

COATINGS

7766 Fundamentals of Paint, Varnish and Lacquer Technology. Chap. IX. Formulation. II. Elias Singer. *American Paint Journal*, v. 38, Feb. 15, 1954, p. 64 + 8 pages.
Composition of pigments and vehicles; application and film properties; cost requirements; and manufacturing cnosiderations.

7767 TME (Trimethylolethane). A New Polyol for the Coatings Industry. Ely Balgley. *American Paint Journal*, v. 38, Mar. 1, 1954, p. 65, 68-69, 72, 74, 76, 78.
Structure, properties, and use in alkyd resin paints. Graphs, tables.

7768 New Aircraft Coating for Corrosion Prevention. M. W. Larson. *Aviation Age*, v. 21, Feb. 1954, p. 62-65.
Coating developed gives resistance to Skydrol hydraulic fluid. It was found to be an excellent protective coating for use in exhaust path areas as well. Table, graphs.

7769* Organic Coatings for Corrosion Protection. (Dutch.) T. van der Klis. *Bedrijf en Techniek*, v. 9, no. 195, Jan. 30, 1954, p. 50-53, 65.

Application and effectiveness of various organic coatings. Diagrams, tables. 5 ref.

7770 Kinetics of Coating Phenomena, in Particular of Phosphating Process. W. Machu. *Henry Brutcher, Altadena, Calif. Translation no.* 2806, 21 p. (From *Archiv für Metallkunde*, v. 3, no. 6, 1949, p. 203-208.)

Establishment of relationship for rate of formation of protective coatings on metals. Tables. 9 ref.

7771 Testing of Metallic and Nonmetallic Protective Coatings for Corrosion Resistance in an Artificial Industrial Atmosphere. W. Kesternich. *Henry Brutcher, Altadena, Calif., Translation no.* 3125, 5 p. (From *Stahl und Eisen*, v. 71, no. 11, 1951, p. 587-588.)

A simple and rapid condensation test for effectiveness of metallic and non-metallic protective coatings when exposed to various atmospheres. Photographs, graphs, diagram.

7772 Reactions of Molten Zinc-Aluminum Alloys With Solid Iron. E. Gebhardt and I. Schmidt. *Henry Brutcher, Altadena, Calif., Translation no.* 3128, 15 p. (From *Zeitshcrift für Metallkunde*, v. 39, no. 11, 1947, p. 321-325.)

Weight losses of Fe specimens in molten Zn-Al and Zn-Al-Cu were plotted against reaction time and bath composition. Graphs, micrographs. 12 ref.

7773 Micrographic Analysis of Ferroalloys and Alloy Steels by Heat Tinting. S. S. Gorelik and B. G. Livshits. *Henry Brutcher, Altadena, Calif., Translation no.* 3193, 6 p. (From *Zavodskaya Laboratoriya*, v. 16, no. 5, 1950, p. 578-580.)

Relationship between dissociation pressure of oxide and thickness of oxide film formed by atmospheric O at increased temperatures. Micrographs. 6 ref.

7774* Measurement and Factors Affecting Reflectance at Glazed and Enamelled Surfaces. *Ceramics*, v. 5, Jan. 1954, p. 492-496, 502.

Includes photograph, table.

7775 The Protective Action of Pigments on Steel. M. J. Pryor. *Electrochemical Society, Journal*, v. 101, Mar. 1954, p. 141-148.

Action of aqueous extracts from litharge; metallic and red leads; basic lead carbonate; and Zn and ZnO on corrosion of steel. Tables, graphs, diagram. 24 ref.

7776 Adhesion and Surface Preparation in Protective Metal Spraying. I. J. M. Cowan. *Electroplating and Metal Finishing*, v. 7; *Metal Spraying*, v. 4, Feb. 1954, p. 79, 81-82.

Reviews adhesion of sprayed-metal coatings; methods of measuring adhesion quantitatively; influence of surface preparation and spraying conditions on adhesion; and various types of grit and sand blasting equipment. Diagrams, tables. (To be continued.)

7777* Silicone Resins as Paint and Insulating Substances. (German.) E. Pirson and M. Wick. *Fette und Seifen*, v. 55, no. 11, Nov. 1953, p. 792-795.

Effective use of highly-condensed resins as binders for paints with high resistance and flexibility. Use of resins with different pigments and application of silicon-resin solutions in production of electrical insulators. 14 ref.

7778 A Plant for Applying Vitreous Enamel to Aluminum. J. M. Steele. *Finish*, v. 11, Mar. 1954, p. 38-40, 66.

Detailed layout, outline of equipment requirements, and brief review of application routine. Diagram.

7779 The History of Phosphatizing. L. K. Schuster. *Finish*, v. 11, Mar. 1954, p. 45-46, 68-69, 82.

Historical discussion of a subject of growing importance to all manufacturers of fabricated sheet metal products.

7780* Metallography of Tin, Tin Alloys, and Tin Coating on Steel. (Czech.) Josef Teindl. *Hutnické Listy*, v. 9, no. 2, Feb. 1954, p. 95-98.

New ways of cleaning, coating, polishing, and etching. Methods for metallographic research of tin layers on steel. Micrographs, diagrams. 14 ref.

7781 Mechanism of Drier Action. *Industrial and Engineering Chemistry*, v. 46, Mar. 1954, p. 562-572.

Includes "Introduction", John K. Wise; "Proposal", E. R. Mueller; and "Panel Discussion", W. O. Lundberg, F. M. Greenwald, Francis Scofield, and E. B. Fitzgerald. Presented at 124th meeting, ACS, Chicago, Ill., Oct. 1953. Graphs. 59 ref.

7782 Microstructure of Paint Films. E. G. Bobalek, L. R. Lebras, A. S. Powell, and William von Fischer. *Industrial and Engineering Chemistry*, v. 46, Mar. 1954, p. 572-577.

Experimental studies. Micrographs. 11 ref.

7783 How We Paint Steel Equipment of Stores. Les Slikkers. *Industrial Finishing*, v. 30, Feb. 1954, p. 26-28, 30, 32.

Metal cleaning and surface preparation operations. Photographs.

7784 Dry Lubricant Film Put on Like Enamel. A. E. Brown. *Industrial Finishing*, v. 30, Feb. 1954, p. 50-52, 54, 56.

Coating material is a mixture of thermosetting resins, graphite, and other ingredients, compounded to provide specialized lubricative properties. Photographs.

7785* Bright Plating Processes. *Industrial Finishing (London)*, v. 6, Jan. 1954, p. 413-421.

Processes for brigh deposition of Cu, Zn, Ni, white brass, and Cr, which can materially help to lower production costs and reduce polishing and buffing times. Table, graph.

7786* Maintenance Painting. T. A. Banfeld. *Industrial Finishing (London)*, v. 6, Jan. 1954, p. 426-432.

Corrosion conditions with applicable methods of prevention.

7787* Temporary Protective Coatings. *Industrial Finishing (London)*, v. 6, Feb. 1954, p. 501-504.

Scope, nature, and efficiency of available systems for protection during temporary storage or idle periods. Table.

7788* Corrosion and Preservation of Industrial Steelwork. L. A. Ravald. *Industrial Finishing (London)*, v. 6, Feb. 1954, p. 508 + 10 pages.

Corrosion of mild structural steel and protection by various coatings. Photographs, table, chart.

7789* The New Look on Walls. Norman Bertollo. *Interchemical Review*, v. 12, Winter, 1953-54, p. 87-96.

Composition, manufacture, and properties of latex paints. Tables, photograph, micrographs. 5 ref.

7790 Effect of Rust and Environment on Inhibition by Zinc-Rich Paints. J. E. O. Mayne. *Iron and Steel Institute, Journal*, v. 176, Feb. 1954, p. 140-143.

Paint films containing 96% of Zn dust are capable of protecting rusting surfaces against corrosion by sea- or rain-water. Graphs, tables. 6 ref.

7791 Atmospheric Exposure Tests With Zinc-Rich Polystyrene Paints. J. E. O. Mayne. *Iron and Steel Institute, Journal*, v. 176, Feb. 1954, p. 143-146 + 1 plate.

Experimental methods and results. Table, photographs, graphs.

7792* Preparation of Thin Layers on a Tantalum Support. Techniques in Obtaining Highly Adhesive Thermal Deposits and Fixation of Tantalum to Copper by Brazing. (French.) P. Garin, P. Léger, and P. Prugne. *Journal de physique et le radium*, v. 15, no. 1, Jan. 1954, p. 45A-46A.

Method of applying Ta foil to Fe and Cu used as target supports in Van de Graff experimentation. 12 ref.

7793 Electrical Measurements in the Study of Immersed Paint Coatings on Metal. I. Comparison Between Capacitance and Gravimetric Methods of Estimating Water-

Coatings

Uptake. D. M. Brasher and A. H. Kingsbury. *Journal of Applied Chemistry*, v. 4, Feb. 1954, p. 62-72.
Includes graphs, tables. 6 ref.

7794* Low Alloy Steel for the Facing of Hydroturbine Blades. (Russian.) I. R. Krianin and G. I. Babushkina. *Liteinoe Proizvodstvo*, 1954, no. 1, Jan.-Feb. p. 2-5.
Results of laboratory and industrial tests show 20 GS-L steel meets mechanical and fatigue strength requirements. Tables, graphs, micrographs. 4 ref.

7795 New Epoxy Primer Has High Resistance to Alkalies. H. L. Farber. *Materials & Methods*, v. 39, Feb. 1954, p. 93-95.
Advanced flow coating technique combined with new primer permits thinner film thickness and improves corrosion resistance three times. Photographs.

7796 Where Asphalt Coatings Are Used. Gale Benn. *Materials & Methods*, v. 39, Feb. 1954, p. 142-144.
Industrial asphalt emulsion coatings show superior performance under extreme conditions of exposure. Photographs, graph.

7797* The Effect of Accelerators in Phosphatizing. (Dutch.) E. J. Vollers. *Metalen*, v. 8, no. 23, Dec. 15, 1953, p. 415-418.
Methods of accelerating phosphatizing process with aid of nitrates, nitrites, and chlorates. Tables, graphs.

7798* Continuous Galvanization of Steel Strips. (French.) M. A. Ollivet. *Métallurgie et la construction mécanique*, v. 86, no. 1, Jan. 1954, p. 49-51.
Output, economy, quality, and employees' working conditions. Photograph, diagram.

7799* Research on the Galvanization of Cooking Utensils. (French.) A. Gordet. *Métallurgie et la construction mécanique*, v. 86, no. 2, Feb. 1954, p. 129-131.
Compares weights of utensils before and after galvanization. Tables. (To be continued.)

7800* General Remarks on the Production of Tin Plate. (French.) Louis Gascuel. *Métallurgie et la construction mécanique*, v. 86, no. 2, Feb. 1954, p. 133-135.
Production methods, tin coating, electrolytic tinning, and various kinds of tin plate. Diagram, photographs.

7801* Clad Metals for Stampings. Ernest C. Morse. *Modern Industrial Press*, v. 16, Feb. 1954, p. 44, 46, 48, 50, 52.
Discusses clad plate, including bonding, forming, and applications. Diagrams, photographs.

7802 The Application of the Polarograph to the Paint Industry. W. P. Georgans. *Oil & Colour Chemists' Association, Journal*, v. 37, Feb. 1954, p. 84-100.
Conditions found suitable for a number of polarographic estimations and construction of a simple, inexpensive polarograph. Graphs, diagrams. 42 ref.

7803 Recent Developments in Silicone Vehicles for Maintenance Paints. R. C. Hedlund. *Organic Finishing*, v. 15, Feb. 1954, p. 16-18.
Fast drying silicone-vehicle, silicone-alkyd co-polymer, and modified silicone-alkyd resins. Photographs, tables.

7804* Isotopic and Chromatographic Techniques Applied to Protective Coatings Technology. Philip Heiberger. *Paint and Varnish Production*, v. 44, Feb. 1954, p. 21-27, 66.
Advantages of techniques when minute quantities of a material must be observed and when material being traced is difficult to separate from other substances with which it is associated. 18 ref.

7805 Paint and Corrosion. *Paint Manufacture*, v. 24, Feb. 1954, p. 61-62.
Electrical measurements in study of paint coatings on metal and mechanism of protection by paints.

7806* Progress in the Paint Industry. *Paint, Oil & Chemical Review*, v. 117, Feb. 11, 1954, p. 28-36.
Styrenated oils; latex, aerosal, fire retardant, and temperature indicating paints; thixotropic vehicles; vinyl, epoxy, and silicon resins; water soluble industrial coatings; ortho titanic acid esters; and lacquer emulsions. Tables.

7807* The Use of Safflower Oil in Paint Vehicles. Joseph W. Prane. *Paint, Oil & Chemical Review*, v. 117, Feb. 25, 1954, p. 18, 36-38, 40.
Properties and applications. Tables, graphs.

7808* Electro-Osmotic Examination of Paint Films. II. J. K. Wirth and Willi Machu. *Paint, Oil & Chemical Review*, v. 117, Mar. 11, 1954, p. 26-29, 44.
Equipment and techniques for measuring porosity of films. Results explain some aspects of corrosion under protective coatings. Tables, diagram, graph. 6 ref.

7809 Proper Coatings Just as Important for Fiber Materials as for Metals. L. G. Jones. *Power Engineering*, v. 58, Feb. 1954, p. 80-81.
Fiber materials such as wood, cotton, rope, and paper can deteriorate even more rapidly than metals without good protection. Points to help select proper paints and varnishes. Tables, photographs.

7810 Choosing Your Paint. E. Johnson. *Product Finishing*, v. 7, Feb. 1954, p. 53-58, 108, 110.
Reviews factors to be considered including suggestions for various tests that can be applied for checking quality of paints.

7811* Protection of Aluminum and Its Alloys With Paints. I. (French.) André Guilhaudis and Régine Bourbon. *Revue de l'Aluminium*, v. 31, no. 206, Jan. 1954, p. 7-10.
Importance of proper surface preparation. Various cleaning methods and coatings. Photographs. (To be continued.)

7812 Surface Treatment and Finishing of Light Metals. VIII. S. Wernick and R. Pinner. *Sheet Metal Industries*, v. 31, no. 322, Feb. 1954, p. 115-122, 128.
Vitreous enameling of light alloys. Tables, graphs. 20 ref. (To be continued.)

7813 Surface Treatment and Finishing of Light Metals. IX. S. Wernick and R. Pinner. *Sheet Metal Industries*, v. 31, no. 323, Mar. 1954, p. 223-226.
Organic finishing of Al and its alloys. Photographs. (To be continued.)

7814 Controlled Hot Dip Galvanizing. II. K. S. Frazier. *Steel*, v. 134, Feb. 22, 1954, p. 102-103.
Length of submersion is a vital question. Photographs, graphs. (To be continued.)

7815 Hot Dip Galvanizing. II. Control of Dross Formation. K. S. Frazier. *Steel*, v. 134, Mar. 1, 1954, p. 98-99.
Controls of timing temperature and cleanliness of work automatically improve uniformity and product quality. Photograph, diagram, graphs.

7816* Adhesion of Zinc Coats to Basic Metal. (Russian.) K. M. Gorbunova and P. D. Dankov. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 11, Nov. 1953, p. 1725-1730.
Scaling depends on preliminary passivation in various media to which metal is subjected. Diagrams, table, micrograph. 15 ref.

See also:
7676 (sodium methylsiliconate for coatings)
8466 (microhardness of diffused Si coatings)
8567 (coatings in cold forming of metals)

CORROSION

7817 Stability of Refractories in Liquid Metals. E. L. Reed. *American Ceramic Society, Journal*, v. 37, Mar. 1954, p. 146-153.
Corrosion of Mo, W, Ta, Re, and ceramic materials by liquid Na, Bi, and Sn. Photographs, diagrams, micrograph, tables, graph. 6 ref.

7818* Control of Internal Corrosion of Tankers. William B. Jupp, and Carl J. Lamb. *American Society of Naval Engineers, Journal,* v. 66, Feb. 1954, p. 152-165.

Effects of corrosion on ship life. Mechanical and electrochemical approaches in solving problem. Tables. 9 ref.

7819 Corrosion Characteristics of Stainless Steels in Oxidizing Solutions (Corrosion in Nitric Aicd Solutions). M. M. Kurtepov and G. V. Akimov. *Henry Brutcher, Altadena, Calif., Translation no.* 3078, p. (From *Doklady Akademii Nauk SSSR,* v. 87, no. 1, 1952, p. 93-95.)

Experimental study of effects on corrosion rate of stainless steel by $K_2Cr_2O_7$, $KMnO_4$, and ammonium vandate additions to nitric acid solutions. Tables, graph.

7820 Influence of Furnace Atmosphere on the Surface of Tube Rounds and Tubes. W. Scheurer. *Henry Brutcher, Altadena, Calif., Translation no.* 3086, 21 p. (From *Stahl und Eisen,* v. 72, no. 16, 1952, p. 935-941.)

Statistical evaluation of about 1000 tube rounds and actual investigations at a tube reducing mill on about 1600 tubes for surface defects after passage through continuous furnace to find the source of defects. Graphs, micrographs. 39 ref.

7821 Contribution to the Problem of Corrosion Fatigue. G. V. Karpenko. *Henry Brutcher, Altadena, Calif., Translation no.* 3160, 4 p. (From *Doklady Akademii Nauk SSSR,* v. 79, no. 2, 1951, p. 287-288.)

Results of rotating-beam fatigue tests on a 0.20% C, 0.85% Cr structural steel (pearlite + ferrite) conducted in air, distilled water, and water containing 1% saponin. Photographs, graph. 3 ref.

7822 Effect of the Frequency of Stress Cycles Upon the Fatigue of Steel in Surface-Active and in Corrosive Media. G. Karpenko. *Henry Brutcher, Altadena, Calif., Translation no.* 3202, 8 p. (From *Doklady Akademii Nauk SSSR,* v. 87, no. 5, 1952, p. 797-800.)

Previously abstracted from original. See item no. 12776, v. 2, Nov. 1953.

7822a The Rate of Dissolution of Copper. Benjamin C.-Y Lu and M. F. Graydon. *Canadian Journal of Chemistry,* v. 32, Feb. 1954, p. 153-163 + 1 plate.

Rate of dissolution of polycrystalline metallic Cu in H_2SO_4 solutions determined as a function of temperature, oxygen pressure, rotation speed, hydrogen ion concentration, sample area, and corroding solution volume. Graphs, micrographs, tables. 7 ref.

7823* Corrosion for Chemical Engineers. I. Electrochemical Principles of Corrosion. L. L. Shreir. *Chemical & Process Engineering,* v. 35, Feb. 1954, p. 41-45.

Electrochemical consideration as theoretical background for subsequent articles. Diagrams, tables, graphs. 30 ref.

7824 Chlorimet 3. Walter A. Luce. *Chemical Engineering,* v. 61, Mar. 1954, p. 254, 256, 258, 260.

Resistance of this important material of construction to a number of corrosives, with mechanical properties and applications in the chemical industry. Charts.

7825 Evaluation of Several Sets of Constants and Several Sources of Variability. V. W. Vaurio and Cuthbert Daniel. *Chemical Engineering Progress,* v. 50, Feb. 1954, p. 81-86.

Test designed to establish sources of variation in prune-pack results is described for tin-plate corrosion-resistance investigations. Tables, diagrams. 8 ref.

7826 Cathodic Protection and Control of Corrosion in the Middle East. W. C. R. Whalley. *Chemistry & Industry,* 1954, no. 6, Feb. 6, p. 140-147.

Corrosion problems in buried oil pipes. Photographs, diagram, graphs, map.

7827 Cathodic Protection as Applied to Royal Canadian Naval Vessels in Active Service. K. N. Barnard. *Chemistry & Industry,* 1954, no. 7, Feb. 13, p. 172-182.

Techniques of application; results obtained; and advantages and disadvantages of systems employing Mg, steel, graphite, or Pt anodes. Diagrams, graphs, table.

7828 Reactions of Salts in Boilers. R. S. Young. *Combustion,* v. 25, Feb. 1954, p. 55-56.

Certain types of internal deposits on boiler metal, including Cu, explained on hypothesis that H under pressure has property of displacing metals and metal oxides from solution. 4 ref.

7829* Comparison of the Oxidation Mechanism of Iron-Chrome, Nickel-Chrome, and Nickel-Aluminum Binary Alloys. (French.) Jean Moreau and Jacques Bénard. *Comptes rendus,* v. 237, no. 22, Nov. 30, 1953, p. 1417-1419.

Examination of specimens was accomplished by X-ray diffraction and micrography of polished sections. Diagram. 4 ref.

7830* Laboratory Methods for Evaluation of Inhibitors for Use in Oil and Gas Wells. E. C. Greco and J. C. Spalding, Jr. *Corrosion,* v. 10, Mar. 1954, p. 103-109.

Based on paper presented at 9th Annual Conference and Ex- Methods used by ten major producing companies, four chemical manufacturing companies, and a university. General classification of tests used in laboratory along with information as to correlation of such tests with field experience. Tables, graph.

7831* Influnece of the Dimension of Test Specimens on the "Adsorption" and Corrosion Fatigue of Steel. (Russian.) G. V. Karpenko and A. V. Karlashov. *Doklady Akademii Nauk SSSR,* v. 92, no. 3, Sept. 21, 1953, p. 603-605.

Investigation on structural steel in water, air, and oil. Method of testing is described. Table, graphs. 3 ref.

7832 Radioactive Tracers in the Study of Pitting Corrosion on Aluminum. P. M. Aziz. *Electrochemical Society, Journal,* v. 101, Mar. 1954, p. 120-123.

Radioactive Co and Pb ions in solution were used to study distribution of local cathodes on Al alloy specimens which were actively pitting. Processes of film breakdown and repair on Al alloy specimens, after introducing them into a corrosive environment, were studied. Micrograph, radiographs. 10 ref.

7833 The Kinetics of Oxidation of High Purity Nickel. E. A. Gulbransen and K. F. Andrew. *Electrochemical Society, Journal,* v. 101, Mar. 1954, p. 128-140.

Effect of time, temperature, and surface pre-treatment studied in temperature range 400 to 750 C, using a vacuum microbalance technique. Tables, graphs. 31 ref.

7834* Corrosion of Steel-Cored Aluminium Conductors. J. S. Forrest and J. M. Ward. *Engineering,* v. 177, Feb. 5, 1954, p. 183.

Methods of measuring corrosion.

7835* Vapor Phase Corrosion Inhibitors. I. D. G. Berwick and B. H. Levelton. *Engineering Journal,* v. 37, Feb. 1954, p. 128-131.

Vapor phase inhibitors must be stable, water-soluble, and sufficiently volatile to maintain an adequate inhibiting concentration in atmosphere around metal to be protected. Photographs. 15 ref.

7836 Thermodynamics of Irreversible Processes Applied to Corrosion. P. A. Johnson and A. L. Babb. *Industrial and Engineering Chemistry,* v. 46, Mar. 1954, p. 518-523.

Application of polarization data to determination of corrosion currents was studied as a part of a survey of possible methods for measuring instantaneous corrosion rates of metals in solution. Diagrams, graph, table. 11 ref.

7837* Application of the Kinetics of Reaction to the Study of Corrosion. (French.) T. G. Owe Berg. *Journal de chimie physique,* v. 50, nos. 11-12, Nov.-Dec. 1953, p. 617-623.

Rates of dissolution of various metals in acid solutions and various aspects of process of dissolution. Graphs. 20 ref.

7838 Stress-Corrosion of Aluminium-Magnesium Alloys. I. The Effect of Tensile Stress on the Corrosion of Aluminium-7%-Magnesium and Aluminium-5%-Magnesium Alloys. II. Methods for Expressing Stress-Corrosion Susceptibility on a Comparative Basis. E. Lloyd Jones. *Journal of Applied Chemistry,* v. 4, Jan. 1954, p. 1-10.

Wires tested by immersion in 3% sodium chloride solution. Threshold stress values determined. Local areas appeared more susceptible to attack. Tables, diagram, graphs. 9 ref.

Corrosion

7839 Corrosion of Iron in the Presence of Dispersed and Solid Sulphur. Raymond B. Seymour, Walter R. Pascoe, and Robert H. Steiner. *Journal of Applied Chemistry*, v. 4, Jan. 1954, p. 11-13.

Investigation to supply additional information and substantiate previous observations, and standard water-works practice. Tables. 4 ref.

7840* Examination of the Cracks of the Tubes of "Vogelbusch" Evaporating Boilers Used in Alumina Plants. (Hungarian.) István Kurovszky. *Kohászati Lapok*, v. 9, no. 1, Jan. 1954, p. 27-34.

Investigates tubes in two Hungarian factories. Causes of intercrystalline corrosion and elimination of defects. Diagram, tables, micrographs, photographs.

7841* Theoretical and Experimental Study of Some Phenomena of Dezincification in Brasses. I. Types of Corrosion in Brasses—Dezincification. Causes and Theories. (Italian.) Paolo Lombardi. *Metallurgia italiana*, v. 45, no. 12, Dec. 1953, p. 449-456.

Investigates various-types of corrosion in Cu-Zn alloys. Table. (To be continued.)

7842* High Temperature Oxidation of Cu-Al Alloys. (Italian.) Paolo Spinedi. *Metallurgia italiana*, v. 45, no. 12, Dec. 1953, p. 457-461.

Experiments with various Cu-Al alloys. Variations in weight as function of temperature were measured. Graphs. 15 ref.

7843 Applications of Aluminium in the Bleaching-Powder Industry. Y. C. Cheng and T. H. Taeng. *Sheet Metal Industries*, v. 31, no. 322, Feb. 1954, p. 143-150.

Tests show that bleach does attack Al but less than other materials. Tables, graphs, photographs.

7844* The Passivity of Thallium in Perchloric Acid, Sodium Chloride, and Sodium Sulfate Solutions. (German.) Willi Machu and Ezzat M. Khairy. *Werkstoffe und Korrosion*, v. 5, no. 1, Jan. 1954, p. 11-17.

Experiments prove two different phases occur in passivity. Diagram, graphs, tables. 9 ref.

7845* The Influence of pH on Process of Metal Corrosion. (Russian.) L. I. Antropov. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 11, Nov. 1953, p. 1631-1635.

Tests on Fe, Ni, Zn, and Mg, show corrosion velocity and potential dependent on pH of the solution. Table. 19 ref.

See also:

7483 (mitigation of marine fouling by anaerobic treatment)
7771 (corrosion tests)
7775 (corrosion protection for steel)
7788 (corrosion of structural steel)
7790 (corrosion resistance of Zn dust paint)
7791 (corrosion resistant paint)
7805 (paint and corrosion)
8664 (corrosion resistance of alloy steels)
9026 (corrosion of Al solder)

ELECTRICAL ENGINEERING

7846* Derivation of the Laws of Force for All Types of Magnetic and Electric Transducers From Two General Laws. (German.) F. A. Fischer. *Acustica (Supplement)*, v. 3, no. 3, 1953, p. 441-448.

Includes tables, diagrams. 5 ref.

7847 A Method for Growing Barium Titanate Single Crystals. J. P. Remeika. *American Chemical Society, Journal*, v. 76, Feb. 5, 1954, p. 940-941.

Method of producing crystals for experimental purposes. 4 ref.

7848 Design and Application of Explosionproof Equipment. R. P. Northup. *American Petroleum Institute, Proceedings*, sec. III, v. 33, 1953, p. 329-334; disc., p. 335-336.

Requirements for construction, recommendations for maintenance procedures, and special considerations important to selection of correct equpiment for each installation. Diagrams. 3 ref.

7849* Control of Metal Build-Up in Minimum Pressure Sensitive Contact Systems. J. P. Dallas and T. R. Stuelpnagel. *Application and Industry*, 1954, no. 10, p. 398-403.

Automation reliability as a function of sensitive contact signal sensing devices. Diagrams. 7 ref.

7850* Backlash in a Velocity Lag Servomechanism. Nathaniel B. Nichols. *Application and Industry*, 1954, no. 10, p. 462-467.

Amplitude and period of sustained oscillations computed by frequency response method. Graphs, diagram. 6 ref.

7851* The Influence of Irradiation of the Impulse Breakdown of Sphere-Gaps. *Brown Boveri Review*, v. 40, no. 7, July 1953, p. 215-233.

Accuracy of high-voltage measurements with sphere-gaps depends greatly on the irradiation present, particularly for positive impulses and fairly long gap-lengths. Investigations verified and extended. Photograph, graphs, table. 16 ref.

7852 Improved Transformer Design. *Canadian Metals*, v. 17, Mar. 1954, p. 20, 22, 24-25.

Transformers produced in a recently enlarged Canadian plant were re-designed, using a steel with oriented grain, to make a smaller, more efficient unit. Photographs.

7853* Definition and Calculation of Self Induction Coefficient of Supereonductors. (French.) Georges Philbert. *Comptes rendus*, v. 237, no. 22, Nov. 30, 1953, p. 1403-1405.

Theoretical discussion. Diagram. 1 ref.

7854* Variations in Dielectric Constant of Several Plastic Materials as a Function of Electric Field. (French.) Guy Mesnard and Lucien Eyraud. *Comptes rendus*, v. 237, no. 22, Nov. 30, 1953, p. 1406-1407.

Experimental device and results obtained. 2 ref.

7855* Al Connector Requirements Set Up. I. Matthysse and H. P. Dupre. *Electrical World*, v. 141, Feb. 22, 1954, p. 104-107, 200.

Proper design and installation are considered vital factors for long life and trouble-free service when bimetallic joints are involved. Photographs, graphs, diagrams.

7856* Switching Surges on High Voltage Cable Lines. A Case History of Their Cause and Cure. E. L. Michelson and Charles McNamara. *Electric Light and Power*, v. 32, Feb. 1954, p. 82-86, 88.

Practical operating experience on the Chicago high-voltage system is analyzed. Diagrams.

7857* Slit-Number Rules and Their Connection With the Magnetic Noise of Nonsynchronous Motors. (German.) Heinz Jordan and Hubert Rothert. *Elektrotechnische Zeitschrift*, v. 74, Ausgabe A, no. 22, Nov. 11, 1953, p. 637-642.

Reasons for magnetic noises of motors, mechanical oscillations, and physical processes taking place; effects of motor dimensions and material of individual parts and conclusions on slit-number rules. Diagrams, table, oscillograph, graphs. 18 ref.

7858* Rapid Change-Over in Starting Generators of Power Plants. (German.) Hans-Otto Fieguth. *Elektrotechnische Zeitschrift*, v. 74, Ausgabe A, no. 22, Nov. 11, 1953, p. 647-650.

Transfer from foreign circuit to normal operation of power plant by way of generator terminals. Details of a series of experiments for determining optimum method of change-over. Diagrams, tables. 7 ref.

7859* High Voltage Oil Flow Circuit Breaker for Large Breaking Capacities With Pump Installation. (German.) Erwin Marx and Ludwig Schmitz. *Elektrotechnische Zeitschrift*, v. 74, Ausgabe A, no. 24, Dec. 11, 1953, p. 693-698.

Requirements, dimensioning of various parts, and test results. Oscillogram, graph, photograph, diagram. 9 ref.

7860* The Voltage Dependence of Loss Factor in Foil-Paper Condensers. (German.) R. Guthmann. *Elektrotech-*

nische Zeitschrift, v. 75, Ausgabe A, no. 2, Jan. 11, 1954, p. 45-48.

Foil-paper condensers satisfactory since they are not subject to aging or wear. Their life exceeds other materials. Table, graphs. 6 ref.

7861* Grooved Insulator With a Surface Coating. (German.) H. v. Cron. *Elektrotechnische Zeitschrift*, v. 75, Ausgabe A, no. 3, Feb. 1, 1954, p. 65-69.

Experiments show advantages of grooved over smooth insulators. Investigation was made with salt containing and salt free layers. Diagrams, graphs, photographs, tables. 11 ref.

7862* Seignette Electricity. (German.) F. Spitzer. *Elektrotechnische Zeitschrift*, v. 75, Ausgabe A, no. 3, Feb. 1, 1954, p. 76-81.

Phenomena, theory, and application. Properties are similar to ferromagnetism. Graphs. 20 ref.

7863* Measurement of Quickly Changing Pressures in High Voltage Switching Devices. (German.) Robert Schwetzke. *Elektrotechnische Zeitschrift*, v. 75, Ausgabe A, no. 3, Feb. 1, 1954, p. 84-89.

Describes measuring devices. Graphs, diagrams, table, photograph. 7 ref.

7864* Measuring Ground Voltage on a 220 Kv. Transformer Station. (German.) Heinrich Langer. *Elektrotechnische Zeitshrift*, v. 75, Ausgabe A, no. 4, Feb. 11, 1954, p. 97-105.

Grounding installation, measuring apparatus, and procedure. Graphs, diagrams, photographs, tables. 7 ref.

7865* Development Lines of Electrical Construction Elements in Communication Technics. (German.) P. Henninger. *Frequenz*, v. 7, no. 12, Dec. 1953, p. 345-359.

Adjustment to a frequency band; prescribed current form and intensity; peak load; requirements of small losses; and environment. Diagrams, graphs, photographs.

7866* Development of Electrical Elements in the Field of Communications. (German.) P. Henninger. *Frequenz*, v. 8, no. 1, Jan. 1954, p. 7-17.

Installations and reliability. Photographs, graphs, micrographs, table.

7867* Smoothing of Loss Damping in Basic Circuits. (German.) Helmut Matthes. *Frequenz*, v. 8, no. 1, Jan. 1954, p. 17-28.

Smoothing based on additional damping depending on frequency. Graphs, diagrams. 14 ref.

7868 Electrical Power Principles for Air Conditioning. G. B. Priester. *Heating and Ventilating*, v. 51, Feb. 1954, p. 83-91.

Basic electrical data for both commercial and residential applications. Diagrams, graph, tables, photographs. 15 ref.

7869 Analysis of Hunting Phenomena in Power Systems by Means of Electrical Analogues. D. W. C. Shen and J. S. Packer. *Institution of Electrical Engineers, Proceedings*, v. 101, pt. 2, no. 79, Feb. 1954, p. 21-34.

Elementary approach to theoretical considerations upon which electrical analogues can be used. Diagrams, tables, graphs. 25 ref.

7870 The Measurement and Calculation of Axial Electromagnetic Forces in Concentric Transformer Windings. M. Waters. *Institution of Electrical Engineers, Proceedings*, v. 101, pt. 2, no. 79, Feb. 1954, p. 35-46.

Experimental method determines axial forces in power transformers as applied to a transformer constructed so that various tapping arrangements can be set up. Tables, graph, diagrams. 3 ref.

7871 Discharge Inception and Extinction in Dielectric Voids. H. C. Hall and R. M. Russek. *Institution of Electrical Engineers, Proceedings*, v. 101, pt. 2, no. 79, Feb. 1954, p. 47-55.

Measurements of voltages required to produce discharges in voids within a number of different dielectrics show it is independent of nature of dielectric and of void position. Diagrams, tables, graphs. 18 ref.

7872 A Method of Determining the Dynamic Characteristics of Electric Arcs. D. O. Bishop. *Institution of Electrical Engineers, Proceedings*, v. 101, pt. 4, no. 6, Feb. 1954, p. 18-26.

A testing procedure is developed. Graphs, diagrams. 10 ref.

7873 Capacitor Bushing Theory. W. J. John and M. M. Sakr. *Institution of Electrical Engineers, Proceedings*, v. 101, pt. 4, no. 6, Feb. 1954, p. 91-107.

Theory of bushing with straight-line contour; location and magnitude of minimum radial stress; and theory when limiting stress is occurring at last foil. Tables, graphs. 8 ref.

7874 The Development of a Precision Termination for 0.375-Inch Polythene-Disc-Insulated Coaxial Cable. R. J. Cheetham, E. L. Mathers, and W. W. H. Clarke. *Institution of Electrical Engineers, Proceedings*, v. 101, pt. 4, no. 6, Feb. 1954, p. 135-145.

Use in pulse and bridge testing is outlined and related to accuracy of match required. Photographs, tables, diagrams, graph.

7875 International Conference on Large Electric Systems (C.I.G.R.E.), Proceedings, (Annual Volume), v. 14, 1952. Papers individually paged. Conferénce Internationale des Grands Réseaux Électriques, Paris.

Consists of three volumes covering notes of the convention, record of discussions, and 125 individual papers. Conference papers cover generation, transformation, and cutting off of electric currents; erection, insulation, and maintenance of overhead and underground lines; operation, protection, and interconnection of networks; and special technique of the voltages higher than 220 kv.

7876* Fundamental Oscillations of Coils and Windings. P. A. Abetti and F. J. Maginniss. *Power Apparatus and Systems*, 1954, no. 10, Feb., p. 1-10.

Normal functions are determined of cases, grounded and isolated neutral, for fundamental oscillations only. Examples are given for air and iron-core coils, and transformer windings, both uniform and non-uniform. Graphs, table, diagrams. 14 ref.

7877* Induction Generator Theory and Application. J. E. Barkle and R. W. Ferguson. *Power Apparatus and Systems*, 1954, no. 10, Feb., p. 12-19.

Induction generators offer advantages over synchronous machines in many applications, resulting in simplified installation with economy in first cost and operating and maintenance expenses. Graphs, diagrams. 4 ref.

7878* Dielectric and Other Problems in the Design of a New 330-Kv Outdoor Air Switch. A. H. Powell. *Power Apparatus and Systems*, 1954, no. 10, Feb., p. 31-36.

Fundamental behavior of large insulator stacks; effect of grading devices and corona shields; dielectric strengths of stacks and associated gaps in an air switch; and final switch design which was evolved. Photographs, graph, diagrams. 9 ref.

7879* Stator Insulation Practices for High-Voltage Inner-Cooled Generators. Graham Lee Moses. *Power Apparatus and Systems*, 1954, no. 10, Feb., p. 36-39.

Cooling of coils makes possible greatly increased ratings for active magnetic and conductor materials in large hydrogen-cooled machines. Graphs, photographs, diagrams. 4 ref.

7880* Practical Aspects of Brush Contact Stability. W. B. Belt. *Power Apparatus and Systems*, 1954, no. 10, Feb., p. 44-48.

Poor brush contact can seriously impair commutation; make it impossible to run machines in parallel; and cause instability of speed and output and selective collection of current. Methods of overcoming these faults. Oscillograms, diagrams.

7881* The Use of Microwaves in Observing Commutator and Slip-Ring Surfaces During Operation. A. H. Ryan and S. D. Summers. *Power Apparatus and Systems*, 1954, no. 10, Feb., p. 92-96.

Method of using short-wave radio and wave-guide components for observing and recording surface irregularities of com-

Electrical Engineering

mutators and slip rings during operation of associated machines. Diagrams, graph, oscillograms, photograph.

7882 Automatically Regulated Capacitance Gives You the Best Power Factor Control. E. H. Stivender. *Power Engineering*, v. 58, Feb. 1954, p. 58-61, 108, 111.

Keeping power factor constant by cutting capacitance in and out of circuit has shown many advantages over other methods. Principles and applications. Graphs, diagrams.

7883 Silicone Dielectric Materials. D. F. Christensen. *Product Engineering*, v. 25, Feb. 1954, p. 187-191.

Uses combining excellent insulating properties throughout a wide temperature range. Photographs, graphs, tables.

7884 How to Select Selenium Rectifiers for High Capacity Applications. H. D. James. *Product Engineering*, v. 25, Feb. 1954, p. 192-198.

Uses in individual machine d.c. supply, motor control, dust precipitation, voltage, and frequency regulation. Photographs, diagrams, graphs, tables. 2 ref.

7885* Temperature Resistance of Electrical Insulators. (German.) A. Imhof. *Schweizer Archiv für angewandte Wissenschaft und Technik*, v. 19, no. 12, Dec. 1953, p. 355-358.

Effects of long- and short-time heating on aging, electrical, and physical properties indicate inadequacy of classifying insulating materials on basis of heat resistance. Graphs. 5 ref.

7886* The Industrial Electric Furnace. An Outline of the Forms of Development of Importance to Dutch Industry. (Dutch.) J. J. M. Roos. *Smit Mededelingen*, v. 8, no. 4, Oct.-Dec. 1953, p. 122-137.

Resistance, induction, dielectric, and electric-arc heating. Photographs.

7887 Effect of Polyphase Motors on the Voltage Regulation of Circuits Supplying Three-Phase Welder Loads. Max A. Faucett, Marvin Fisher, Jr., and M. Stanley Helm. *University of Illinois Bulletin, (Engineering Experiment Station Bulletin Series no.* 418,) v. 51, no. 19, Oct. 1953, 42 p. (T1 I6b)

Problem of light flicker caused by operation of an arc welder. Graphs, tables, diagrams, oscillograms.

7888 New Induction Motors. A Result of 20 Years' Progress. S. F. Henderson. *Westinghouse Engineer*, v. 14, Mar. 1954, p. 91-95.

Modernization of a.c. polyphase motors offers great improvements. Table, photographs, graphs, drawing, diagram.

Books and Miscellaneous Publications

7889 Tensors in Electrical Machine Theory. W. J. Gibbs. 238 p. 1952. Chapman & Hall Ltd., London. (TK2211 G35t)

Applications to electrical machines, written for electrical engineers. Elementary aspects of applications are treated in the first four chapters. A brief account of differential geometry is included in later chapters.

7890 Ultra High Frequency Propagation. Henry R. Reed and Carl M. Russell. 562 p. 1953. John Wiley & Sons, New York. (TK6553 R25u)

Current information on UHF radio wave propagation; theory and illustrative examples; and how to determine operational ranges when using UHF communication systems.

See also:

7551 (influence of mineralizers on dielectric properties of procelain)
7558 (electrical behavior of oxide coated electrodes)
7777 (silicone resins as insulators)
7917 (feedback control references)
8024 (engineering problem at power project)
8481 (behavior of metals and semiconductors in liquid dielectrics)
8553 (electrical power in steel mills)
8554 (electrical systems for rolling mills)
8733 (human engineering in electrical control systems)
8787 (dielectric constant as a function of temperature and frequency)
8929 (rubber sleeve connectors for plastic pipes)
8983 (influence of electric fields on heat transfer)

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See also:
7800 (electrolytic tinning)
8003 (plating—plant costs)
8398 (electroplating onto oxide coated metal)
8616 (electrodeposited Sb)
8619 (electrolytic deposit of Cu)

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Formation; electrical properties; correlation between applied light energy and generated photocurrent; sensitivity; and mechanism of photoelectric processes in the cells. Photograph, diagrams, graphs, tables. 34 ref.

7986* Magnetic Blocking Layers in Germanium. (German.) E. Weisshaar and H. Welker. *Zeitschrift für Naturforschung,* v. 8a, no. 11, Nov. 1953, p. 681-686.

Experiments prove that density of electron-hole couples, in a current-bearing intrinsic semiconducter of high electron and hole mobility, can be changed by inserting a transverse magnetic field. Graphs, diagram. 2 ref.

7987* Frequency Dependence of the Appearance of Electron Fluctuations in Semiconductors. (German.) K. W. Böer and K. Junge. *Zeitschrift für Naturforschung,* v. 8a, no. 11, Nov. 1953, p. 753-755.

Effect of frequency on electron fluctuations varies with semiconductor and experimental conditions. Diagrams, graphs. 12 ref.

7988* The Theory of the Magnetic Effects in Isotropic Semiconductors. (German.) Otfried Madelung. *Zeitschrift für Naturforschung,* v. 8a, no. 12, Dec. 1953, p. 791-795.

Hall effect and resistance change in magnetic field of highly mobile semiconductors cannot be adequately described by usual theory. Graphs, table. 8 ref.

7989* Light Absorption of Solid Ammonia Layers With Additions of Alkali Metal. (German.) Edith Bosch. *Zeitschrift für Physik,* v. 137, no. 1, Feb. 1954, p. 89-103.

Nature of hole conduction in thin layers of NH_3, produced by means of quenching condensation and with addition of Na, K, and Li, light absorption and electric conduction of such layers; as well as effect of temperature upon conduction. Table, graphs, diagrams. 13 ref.

7990* The Mode of Action of CdSe Barrier Layers in Selenium Rectifiers. (German.) Arnulf Hoffmann and Frank Rose. *Zeitschrift für Physik,* v. 136, no. 2, Nov. 1953, p. 152-165.

Theoretical background and experimental arrangement. Details of results and an interpretation of phenomena are outlined. Graphs, diagrams. 25 ref.

7991* Calcium Oxide, an Amphoteric Semiconductor. (German.) Karl Hauffe and Gerhard Tränckler. *Zeitschrift für Physik,* v. 136, no. 2, Nov. 1953, p. 166-178.

Conductivity experiments on CaO semiconductors at 600 C in dependence upon O pressure and content of other types of cations. Graphs. 20 ref.

Books and Miscellaneous Publications

7992 Thermionic Valves. A. H. W. Beck. 570 p. 1953. Cambridge Univ. Press, London. (TK7872.V3 B38t)

Divided into fundamental physics of thermionic emission; general theory of fields set up by charged conductors and resulting electron motion; and various classes of tubes.

7993 (Principles of Electron Optics.) **Grudlagen der Elektronenoptik.** Walter Glasser. 699 p. 1952. Springer Verlag, Vienna. (QC447 G46g)

Sections cover image fields and Gaussian dioptrics; theory of geometrical aberrations; and electron optics in wave mechanisms.

7994 Fundamentals of Electronic Motion. Willis W. Harman. McGraw-Hill Electrical and Electronic Engineering Series. 319 p. 1953. McGraw-Hill. (TK7872.V3 H22f)

Presents philosophies and techniques of mathematical physics using electron-tube analysis. Particle dynamics, electromagnetic fields, and wave phenomena. Diagrams, graphs, tables.

7995 Communication Theory. Willis Jackson, editor. 532 p. 1953. Academic Press, New York. (TK5101 J13c)

Papers read at a symposium on "Applications of Communication Theory", held at Inst. of Elec. Engr., London, Sept. 22-26, 1952. Covers transmission systems and coding; transmission in presence of noise—signal discrimination; characteristics of transmission channels; application to television; hearing transmission and analysis of speech; and associated studies.

7996 Dielectric Aerials. D. G. Kiely. Methuen's Monographs on Physical Subjects. 132 p. 1953. John Wiley & Sons, Inc. (TK7872.A6 K54d)

Provides a critical review of existing work and collects design data. Contains a fairly complete bibliography.

7997 Probability and Information Theory, With Applications to Radar. P. M. Woodward. Pergamon Science Series, Electronics and Waves. 128 p. 1953. Pergamon Press Ltd., London. (TK5101 W87p)

Contains an introduction to probability theory, and chapters on wave form analysis and noise; information theory; statistical problem of reception; simple theory of radar reception; mathematical analysis of radar information; and transmitted radar signal.

See also:
7393 (antennas for aircraft)
7890 (ultra high frequency propagation—book)
8200 (cybernetics)
8203 (information theory and its engineering applications—book)
8215 (waveguide measurements)
8221 (electronic instruments)
8281 (cybernetics and product design)
8312 (machine control with electronic servomechanisms)
8630 (conductivity in dislocated Ge)
8744 (military laboratory in electronics research)
8769 (ionization breakdown of gases)
8781 (current noise in semiconductors)

ENGINEERING ECONOMICS

7998* The High Cost of Overhead—What Can We Do About It? J. W. Rockfeller, Jr. *American Printer*, v. 135, Feb. 1954, p. 19-21, 40.

Includes graphs.

7999 Analysis of the Market Situation as a Basis for Forecasting. Elmer Clark Bratt. *Analysts Journal*, v. 10, Feb. 1954, p. 27-32.

Survey of forecasting potentialities of inventory and order series when employed in combination with other market indicators. 20 ref.

8000* Expansion of the Chemical Industry in Belgium. Denmark's Chemical Industry. Economy of German Chemical Industry for 1953. Quantity Boom and Falling Prices. Hans Wittmeyer. **Development of Finland's Chemical Industry.** Y. Talvitie. **The Postwar Achievements of the French Chemical Industry. The Postwar Development of British Chemical Industry. Holland's Chemical Industry. Chemical Balance Sheet for Italy.** Luigi Gozzini. **Chemical Industry as Norway's Most Important Industry. Reconstruction of the Austrian Chemical Industry.** Alfred Herz-Leitgeb. **Portugal's Chemical Industry.** João Maria Barreto Ferreira do Amaral. **Sweden's Chemical Industry.** Peter Fitger. **Swiss Chemical Industry Since the End of the War. Analysis of Spain's Chemical Industry.** (German.) J. Agell y Agell. *Chemische Industrie*, v. 5, no. 12, Dec. 1953, p. 805-847, 849-862.

Includes tables.

8001* Seventy-Five Years of Public Utility Regulation in a Competitive Society. Ralph M. Besse. *Edison Electric Institute Bulletin*, v. 22, Feb. 1954, p. 35-43.

8002* Probable Impact of Atomic Energy on Electric Company Securities. Eldred H. Scott. *Edison Electric Institute Bulletin*, v. 22, Feb. 1954, p. 47-51.

Includes tables.

8003 Depreciation and Maintenance of Metal Finishing Plant. I. Modern Methods of Computation and Accounting. S. Howard Withey. *Electroplating and Metal Finishing*, v. 7, Feb. 1954, p. 54-55.

Analysis of factors influencing depreciation and maintenance. Various methods of computing costs. (To be continued.)

8004* The Engineering Outlook. VI. Textile Machinery. *Engineering*, v. 177, Feb. 12, 1954, p. 202-205.

Changing markets, competition, research, design, and costs. Tables, graphs.

8005 Nonmetallics. *Engineering and Mining Journal*, v. 155, Feb. 1954, p. 103-112, 133-134, 138.

Includes "Sulphur", Langbourne M. Williams; "Potash", G. T. Harley; "Fluorspar", Joseph C. Arundale; "Perlite", S. W. Johnson; "Barite", Reginald Rowland; "Phosphate", H. F. Dengler; "Asbestos", Walter A. Rukeyser; "Mica", Waldemar F. Dietrich; and "Feldspar", Brooke L. Gunsallus. Tables.

8006 The Twilight of American Woolen. Dero A. Saunders. *Fortune*, v. 49, March, 1954, p. 92 + 7 pages.

New England company has bumbled perilously close to liquidation. Background of today's maneuvers, plus a look at the company's chances of carrying on. Photographs.

8007* Deposits of Coal, Iron, Petroleum and Uranium in the World. (German.) Werner Hagen. *Glückauf*, v. 90, nos. 1-2, Jan. 2, 1954, p. 1-31.

Output in various countries. Tables, map. 37 ref.

8008 The Economic Status of the Nuclear-Instrument Industry. Ernest H. Wakefield. *Instrument and Automation*, v. 27, Feb. 1954, p. 278-282.

Analyzes unfavorable profit-and-loss situation of a representative segment of nuclear-instrument industry. Reveals ways in which improvements can be made. Graphs, table.

8009 Growth Possibilities of Electric Furnace Carbon Steel. Willard C. Wheeler. *Iron and Steel Engineer*, v. 31, Feb. 1954, p. 85-92; disc., p. 92-94.

Attempts to predict future increases in production based on past performance of other industries. Graphs.

8010* Capital-Gains Aspects of Oil and Gas Transactions. John F. Y. Stambaugh. *Journal of Accountancy*, v. 97, Mar. 1954, p. 312-315.

Transactions that qualify for capital gain treatment.

8011 Aluminium in the British Commonwealth. *Light Metals*, v. 17, Feb. 1954, p. 39-42.

Surveys resources and developments in power, bauxite, and metal, in British Isles, Canada, Africa, India, and Australia. Maps. 3 ref.

8012 Standardisation Reduces Building Costs. M. J. Sargeaunt. *Machinery Lloyd (Overseas Ed.)*, v. 26, Feb. 13, 1954, p. 79, 81-87.

By use of non-traditional structures, it is possible to divide widely different buildings up into a relatively small number of similar parts which can be line produced in a factory. Photographs.

8013* Economics of Mechanization. Harry E. Stocker. *Mechanical Handling*, v. 41, Feb. 1954, p. 68-71.

Cost considerations in equipment purchases. Photographs.

8014* Zinc Industry Cannot Afford to be Complacent About Present Market Demand for Its Products. R. G. Kenly. *Metals (Daily Metal Reporter Monthly Supplement)*, v. 24, Feb. 1954, p. 7-8, 19.

Metal's use in rubber, paint, brass, die casting, and galvanizing fields may decline somewhat in 1954 but will stay at high levels.

8015* Stable Silver Price Anticipated During 1954; Users Will Be More Dependent on New Sources. Handy & Harmon. *Metals (Daily Metal Reporter Monthly Supplement)*, v. 24, Feb. 1954, p. 9-11, 19. (Excerpts from 38th Annual Review of Silver Market, 1953. Handy & Harmon, New York, N. Y.)

Economic outlook for Ag industry. Tables.

Engineering Economics

8016* U. S. Copper Output Curtailed as Demand Eases While Zinc and Lead Production Drops Further. *Metals (Daily Metal Reporter Monthly Supplement),* v. 24, Feb. 1954, p. 15-16, 19.

Economic trends in domestic metal industries.

8017* Industrial Minerals. Joseph L. Gillson. *Mining Congress Journal,* v. 40, Feb. 1954, p. 67-74, 77, 79-81.

Statistics and developments in production during 1953. Photographs, tables.

8018* Research—Foundation for Mineral Progress. Clyde Williams and David C. Minton, Jr. *Mining Congress Journal,* v. 40, Mar. 1954, p. 22-26.

Economic situation for mineral industries and increased production and demand due to research efforts. Photographs, graphs.

8019* 1953 Paper Production at a New High. Morris C. Dobrow. *Paper Trade Journal,* v. 138, Feb. 26, 1954, p. 72, 74, 76, 78.

Paper-industry production statistics for Canada, Europe, and U. S. Tables.

8020 Round-up of World Oil Activities. Ernestine Adams. *Petroleum Engineer,* v. 26, Mar. 1954, p. A45-A58.

Petroleum operations have spread to 115 nations and territories in 1953. Photographs, tables, map.

8021 Calculating Engineering Economics. I. Utility Costs. Douglas S. Sherwin. *Petroleum Refiner,* v. 33, Feb. 1954, p. 103-105.

Defects of current methods, suggested pattern for estimation. Diagram, table.

8022 As We See It. *Petroleum Refiner,* v. 33, Mar. 1954, p. 134-144.

Petroleum industry statistics. Graphs, tables.

8023 Calculating Engineering Economics. II. Cost classifications. Douglas S. Sherwin. *Petroleum Refiner,* v. 33, Mar. 1954, p. 151-154.

Differentiates between manufacturing and overhead labor; and direct and indirect materials costs. Diagram, table.

8024* The OVEC Project: Economic, Engineering, and Financing Problems of the 2,200,000-Kw 18,000,000,000-Kilowatt-Hour Power Project of the Ohio Valley Electric Corporation. Philip Sporn and V. M. Marquis. *Power Apparatus and Systems,* 1954, no. 10, Feb., p. 49-63.

Problems encountered in setting up the project. Table, diagrams, photograph.

8025* Modern Steel-Making. *Times Review of Industry (Supplement),* 1954, p. 30, 32-35.

Economy of steel production in Britain. Photographs.

Books and Miscellaneous Publications

8026 The American Economy in 1960. Gerhard Colm and Marilyn Young. National Plannning Association, Washington, Planning Pamphlets no. 81, Dec. 1952, 166 p. (HC101 C71a)

Includes "Assumptions and Approach"; "Projection of Total Production in 1960"; "Alternative Budgets for Full Employment"; "An Adjusted Model for Full Employment in 1960"; "Full Employment Models With Higher Defense Budgets"; "The Cyclical Problem"; and "Adjustments in Private and Public Policies". Tables, graphs.

8027 Textbook of Econometrics. Lawrence R. Klein. 355 p. 1953. Row, Peterson & Co., New York. (HB71 K68t)

Includes econometric approach, statistical groundwork, estimation of aggregative models, computational design, methods of sector analysis, econometric applications, and special problems.

See also:
7414 (economics of irrigation)
7592 (petrochemical raw materials costs)
7593 (economics of making high purity aromatics)
7696 (starch in Britain's economy)
8157 (sales promotion)
8165 (accounting records)
8220 (instrument industry)
8273 (cost of special machines)
8319 (prospects for titanium industry)
8326 (cost of machining stainless steel)
8353 (furnace efficiency in cold metal shops)
8413 (cost of alloy cast iron)
8441 (heat treating costs)
8860 (Sweden's raw material problem for plastics)
8961 (world consumption of natural and synthetic fibers)

FLUID MECHANICS

8028 The Effects of Viscosity and Heat Conductivity on the Transmission of Plane Sound Pulses. John R. Knudsen. *Acoustical Society of America, Journal,* v. 26, Jan. 1954, p. 51-57.

Dissipative effects of viscosity and heat conductivity in connection with flow of a compressible fluid in a parallel channel or tube. Graphs.

8029* Flow Tests on Distribution Systems. W. D. Hudson. *American Water Works Association, Journal,* v. 46, Feb. 1954, p. 144-150.

Covers briefly different types of flow tests used in analysis of a distribution system. Graphs, tables, photograph, diagram.

8030* Measuring Flow Velocities of Gases With a Hot Wire Anemometer. II. Details. (German.) Ulrich Jacob. *Archiv für technisches Messen,* 1954, no. 217, Feb., p. 25-28.

Effect of variable temperature eliminated. Method investigates turbulent flow. Diagrams.

8031 Supersonic Gas Flow. W. A. Mair. *British Journal of Applied Physics,* v. 5, Jan. 1954, p. 1-6.

Some important phenomena and principal differences to subsonic plan. Diagrams, graphs. 4 ref.

8032 On the Nusselt Modulus as a Function of Friction Factor, Reynolds and Prandtl Moduli, for Heat Transfer to a Fluid Flowing Turbulently Through a Tube of Circular Section. A. W. Marris. *Canadian Journal of Physics,* v. 32, Feb. 1954, p. 167-189.

Theoretical expressions are developed. Tables. 12 ref.

8033 Interfacial Resistance. R. E. Emmert and R. L. Pigford. *Chemical Engineering Progress,* v. 50, Feb. 1954, p. 87-93.

Study of gas absorption in falling liquid films. Graphs, tables, diagram. 21 ref.

8034* Conditions for the Emergence of Shock Waves in Permanently Plane Flows. (French.) Raymond Marchal. *Comptes rendus,* v. 237, no. 22, Nov. 30, 1953, p. 1392-1395.

Flow of a perfect gas emitted by an ideal centrifugal wheel originating in a plane space between two infinite planes. Diagram.

8035* Application of Radioactivity to Experimental Fluid Mechanics. (French.) Arlette Hée and Paul Keller. *Comptes rendus,* v. 238, no. 1, Jan. 4, 1954, p. 44-46.

Spontaneous deposit of radioactive element can show existence of currents established in a fluid immediately upon contact of moving obstacle. Graph. 2 ref.

8036* Data Concerning Water Compression in a Shock Wave. (French.) Jean Dapoigny, Jean Kieffer, and Boris Vodar. *Comptes rendus,* v. 238, no. 2, Jan. 11, 1954, p. 215-217.

Density of water in an internal shock wave. Velocity measured by X-ray photography. Results agree with Schall. Graphs, photographs. 4 ref.

8037* Modeling Hydraulic Hammer Under Special Conditions of Dynamic Modeling of an Entire Hydroelectric System. (Russian.) I. V. Egiazarov. *Doklady Akademii Nauk SSSR,* v. 92, no. 5, Oct. 11, 1953, p. 899-902.

Analysis of dimensionless coefficients shows it is possible to distort scale of length, pressure, and diameter without distorting cross section of water flow. 4 ref.

8038* Temperature Dependence of Adiabatic Compressibility of Mixtures With Associated Components. (Russian.) V. F. Nozdrev and N. I. Larionov. *Doklday Akademii Nauk SSSR*, v. 92, no. 5, Oct. 11, 1953, p. 991-994.

Study by ultra-acoustic method using mixtures of methyl, ethyl, propyl, butyl, isobutyl, and isoamyl alcohols in a wide temperature range up to their boiling point. Graphs, table. 6 ref.

8039 Skin Friction in Slip Flow. S. A. Schaaf and F. S. Sherman. *Journal of the Aeronautical Sciences*, v. 21, Feb. 1954, p. 85-90.

Data and results in terms of various relevant theories. Tables, graphs, photograph. 17 ref.

8040 Turbulent Boundary Layers in Adverse Pressure Gradients. Francis H. Clauser. *Journal of the Aeronautical Sciences*, v. 21, Feb. 1954, p. 91-108.

Results for effects of Reynolds number, pressure gradient, and roughness on skin friction. Graphs, drawing. 15 ref.

8041 A Demonstration of Compressibility Measurements on Gaseous Fluids. John D. Baron and George M. Watson. *Journal of Chemical Education*, v. 31, Feb. 1954, p. 74-77.

Experiments on a gas above its critical temperature and pressure range up to 1000 atmospheres. Photographs, diagrams, graphs. 5 ref.

8042* Equation for the State of Gases. Measuring Methods for Variations of Volumes of Fluids up to 10,000 Kg. Per Cm² Pressure and 200 C, and the Measuring Method for Temperatures Up to 1200 C. (French.) James Basset and Jacques Basset. *Journal de physique et le radium*, v. 15, no. 1, Jan. 1954, p. 47A-56A.

Includes photographs, diagrams. 11 ref.

8043* On the Kinetics of Anomalous Flow. Charles Mack. *Journal of Polymer Science*, v. 13, Mar. 1954, p. 279-294.

Theory suggested considers structure of system and is based on flow as an order-disorder transition. Graphs, tables. 11 ref.

8044 The Stability of Viscous Flow Between Rotating Cylinders in the Presence of a Radical Temperature Gradient. S. Chandrasekhar. *Journal of Rational Mechanics and Analysis*, v. 3, Mar. 1954, p. 181-207.

Includes tables, graphs. 17 ref.

8045 On Bodies Achieving Extreme Values of the Critical Mach Number. I. D. Gilbarg and M. Shiffman. *Journal of Rational Mechanics and Analysis*, v. 3, Mar. 1954, p. 209-230.

Mathematical discussion. Graphs. 4 ref.

8046 Limiting Behavior of Pressure Derivatives Behind Shocks in Supersonic Gas Flow. W. F. Brown and T. Y. Thomas. *Journal of Rational Mechanics and Analysis*, v. 3, Mar. 1954, p. 231-245.

Plane stationary flow of a gas behind the shock attached to nose of a curved body placed in uniform supersonic stream. Graphs, table. 7 ref.

8047 Calculation of the Temperature Field for Incompressible Laminar Boundary-Layer Flow With and Without Pressure Gradient. J. A. Zaat. *Netherlands National Luchtvaartlaboratorium Report* 130, Oct. 1953, 47 p. (TL526.N3 N38.5r)

Determination of eigen temperature and calculations with prescribed constant and variable wall temperature. Agreement between calculated and measured results was satisfactory. Graphs, tables. 7 ref.

8048* The Determination of Turbulent Skin Friction by Means of Pitot Tubes. J. H. Preston. *Royal Aeronautical Society, Journal*, v. 58, Feb. 1954, p. 109-121.

Simple method developed utilizes a round pitot tube resting on the surface. Graphs, diagram, tables. 16 ref.

8049 On the Stability of Viscous Flow Between Parallel Planes in the Presence of a Co-Planar Magnetic Field. J. T. Stuart. *Royal Society, Proceedings*, v. 221, ser. A, Jan. 21, 1954, p. 189-206.

Linearized equations which govern stability of a viscous, electrically conducting fluid in motion. Tables, graphs. 22 ref.

8050 On Gas Flow in One Dimension Following a Normal Shock of Variable Strength. C. W. Jones. *Royal Society, Proceedings*, v. 221, ser. A, Jan. 21, 1954, p. 257-267.

Mathematical analysis. Graph. 3 ref.

8051 Supersaturation in the Spontaneous Formation of Nuclei in Water Vapor. Adolf Sander and Gerhard Damköhler. *U. S. National Advisory Committee for Aeronautics, Technical Memorandum* 1368, Nov. 1953, 19 p. (TL570 Un3tm) (Translated from *Die Naturwissenschaften*, v. 31, nos. 39-40, Sept. 24, 1953, p. 460-465.)

Supersaturation measured between 35 and −75 C. Influence of presence of ions on condensation process was found to disappear. Break in critical supersaturation as a function of temperature at −62 C. Graphs, diagrams, tables. 13 ref.

8052 Incompressible Flow Past a Sinusoidal Wall of Finite Amplitude. Carl Kaplan. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3069, Feb. 1954, 26 p. (TL570 Un3t)

Possible mathematical troubles that occur in iterative procedures used in present-day aerodynamics. Graphs, tables. 10 ref.

8053 Density Profiles of Subsonic Boundary Layers on a Flat Plate Determined by X-Ray and Pressure Measurements. Ruth N. Weltmann and Perry W. Kuhns. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3098, Feb. 1954, 30 p. (TL570 Un3t)

Laminar, transitional, and turbulent boundary layers investigated in a subsonic wind tunnel at Mach numbers of 0.55 and 0.78, at various Reynolds numbers and at stations along a flat plate. Graphs, photographs, diagrams. 13 ref.

8054* Measuring of Turbulence and Turbulence Components by Means of Corona Discharge. (German.) Wilhelm Fuchs. *Zeitschrift für Physik*, v. 137, no. 1, Feb. 1954, p. 49-60.

Possibilities of measuring individual turbulence components in flowing gases. Effect of flow rate upon corona current. Tables, graphs. 17 ref.

Books and Miscellaneous Publications

8055 Modern Developments in Fluid Dynamics High Speed Flow. L. Howarth. v. I-II. 475 and 875 p. 1953. Clarendon Press, Oxford, England. (TL570 M72)

Volume I covers equations of flow in gases; method of characteristics; shock and blast waves; some exact solutions of the equations of steady homentropic flow of an inviscid gas; one dimensional flow, hodograph transformation; approximate methods; unsteady motion; and boundry layers. Volume II, experimental method; flow past aerfoils and cylinders; flow past bodies of revolution; and heat transfer.

See also:
7406 (flow distribution throughout a rotating impeller)
8188 (fluid flow in turbo-machinery)
8227 (viscometer for high velocity gradients)
8784 (solution of Smoluchowski flow equation)
8977 (friction in fluid flow)
8987 (turbulent flow in pipes)

FOOD TECHNOLOGY

8056* Current Research in Nutrition. Robert E. Olson. *American Dietetic Association, Journal*, v. 30, Feb. 1954, p. 111-116.

Significant areas of current research; outline of certain problems. 40 ref.

8057* New Developments in Food Processing. E. M. Mrak. *American Dietetic Association, Journal*, v. 30, Mar. 1954, p. 236-240.

Developments of consumer requirements from standpoint of acceptability, stability, ease of use or utility, aesthetic values, and nutritive value.

Food Technology

8058* Recent Developments in Precooked Frozen Foods. Helen L. Hanson. *American Dietetic Association, Journal,* v. 30, Mar. 1954, p. 241-244.

Continued expansion depends on production of foods of high initial quality and good storage stability without undue expense. Photographs. 4 ref.

8059* The Antioxidant and Antipolymerization Properties of Gossypol, Dianilinogossypol, and Related Materials. W. G. Bickford, F. C. Pack, L. E. Castillon, and C. H. Mack. *American Oil Chemists' Society, Journal,* v. 31, Mar. 1954, p. 91-93.

Autoxidation of oleic acid and methyl oleate in acetic acid solution with a Co salt as catalyst. Tables. 19 ref.

8060* Phenylacetates in Flavoring. Morris B. Jacobs. *American Perfumer and Essential Oil Review,* v. 63, Feb. 1954, p. 127, 129.

Advantages of uniform nomenclature for aromatic esters having relatively wide application as components in flavor formulations. Photograph.

8061* Vanilla-Like Synthetics. L. C. Cartwright. *American Perfumer and Essential Oil Review,* v. 63, Feb. 1954, p. 133, 135, 137.

Based on paper before Div. of Agricultural and Food Chemistry at 122nd meeting of the ACS. Solubility and volatility of propenyl guaethol, bourbonal, vanillin, and coumarin. Tables. 5 ref.

8062* Orientation Tests Concerning Aroma Losses When Concentrating Solutions. (German.) R. Heiss. *Chemie-Ingenieur-Technik,* v. 25, no. 12, Dec. 1953, p. 711-715.

Processes of concentrating fruit juices. Graphs. 12 ref.

8063 Upsurge: In Canned Soft Drinks. George F. Kay. *Food Engineering,* v. 26, Feb. 1954, p. 86-89.

Equipment and processing of canned carbonated beverages. Photographs, diagram.

8064* Sorbic Acid as a Fungistatic Agent for Foods. I. Harmlessness of Sorbic Acid as a Dietary Component. Harry J. Deuel, Jr., Roslyn Alfin-Slater, Carrol S. Well, and Henry F. Smyth, Jr. **II. Metabolism of α,β-Unsaturated Fatty Acids With Emphasis on Sorbic Acid.** Harry J. Deuel, Jr., Clarence E. Calbert, Lilla Anisfeld, Harry McKeehan, and Harry D. Blunden. **III. Spectrophotometric Determination of Sorbic Acid in Cheese and in Cheese Wrappers.** Daniel Melnick and Frederick H. Luckmann. **IV. Migration of Sorbic Acid From Wrapper Into Cheese.** Daniel Melnick and Frederick H. Luckmann. **V. Resistance of Sorbic Acid in Cheese to Oxidative Deterioration.** Daniel Melnick, Frederick H. Luckmann, and Chester M. Gooding. **VI. Metabolic Degradation of Sorbic Acid in Cheese by Molds and the Mechanism of Mold Inhibition.** Daniel Melnick, Frederick H. Luckmann, and Chester M. Gooding. **VII. Effectiveness of Sorbic Acid in Protecting Cheese.** Donald P. Smith and Norbert J. Rollin. *Food Research,* v. 19, Jan.-Feb. 1954, p. 1-65.

Includes tables, graphs. 109 ref.

8065* Factors Influencing Growth of *Bacillus Coagulans* in Canned Tomato Juice. I. Size of Inoculum and Oxygen Concentration. II. Acidic Constituents of Tomato Juice and Specific Organic Acids. Andrew C. Rice and C. S. Pederson. *Food Research,* v. 19, Jan.-Feb. 1954, p. 115-133.

Includes tables, graphs. 34 ref.

8066* A Histological and Histochemical Study of Beef Dehydration. II. Influence of Carcass Grade, Aging, Muscle and Electrolysis Pre-Treatment. H. N. Wang, E. Auerbach, Virginia Bates, F. Andrews, D. M. Doty, and H. R. Kraybill. *Food Research,* v. 19, Jan.-Feb. 1954, p. 154-161.

Includes diagram, photograph, micrographs, tables. 5 ref.

8067* Retention of Quality in Dehydrated Vegetables Through In-Package Desiccation. R. R. Legault, C. E. Hendel, and W. F. Talburt. *Food Technology,* v. 8, Mar. 1954, p. 143-149.

Effect of in-package desiccation on storage stability of dehydrated white potato, sweet potato, cabbage, carrot, beet, and onion. Tables, graphs. 23 ref.

8068* Thermal Destruction of Microorganisms and Enzymes. II. W. B. Esselen and I. J. Pflug. *Glass Packer,* v. 33, Feb. 1954, p. 28-30, 60, 64.

Despite wide use of thermal death-time data, new processing techniques point to need for still more experience with high temperature. Graphs, photographs. 29 ref.

8069* Fat Rancidity, Recent Studies on the Mechanism of Fat Oxidation in Its Relation to Rancidity. Steward G. Morris. *Journal of Agricultural and Food Chemistry,* v. 2, Feb. 3, 1954, p. 126-132.

Includes table. 66 ref.

8070* Sugar Solubility, Sugar Mixtures in Aqueous Glycerol. J. B. Segur and C. S. Miner, Jr. *Journal of Agricultural and Food Chemistry,* v. 2, Feb. 3, 1954, p. 132-135.

Includes tables, graph, phase diagrams. 8 ref.

8071* Relationship Between Titratable Acidity and pH During Lactic Acid Fermentation in Reconstituted Nonfat Milk. H. H. Wilkowske. *Journal of Dairy Science,* v. 37, Jan. 1954, p. 22-29.

Experimental studies. Graphs, table. 20 ref.

8072* The Effect of the Ensiling Process on Wild Onion and Ragweed Flavors in Silage and in Milk. R. E. Brubaker and P. M. Reaves. *Journal of Dairy Science,* v. 37, Jan. 1954, p. 58-59.

Ragweed flavor was eliminated, onion flavor remained. 3 ref.

8073* Slime Formation on Cottage Cheese. P. A. Davis and F. J. Babel. *Journal of Dairy Science,* v. 37, Feb. 1954, p. 176-184.

Relates storage temp. and production of slime to resistance of causative organisms to heat and chlorine. Tables. 5 ref.

8074* Flavour of Potatoes Treated With Tetrachloronitrobenzene and *iso*Propyl *N*-Phenylcarbamate. A. R. Wilson and J. M. Harries. *Journal of the Science of Food and Agriculture,* v. 5, Feb. 1954, p. 80-85.

Results of experimental studies. Tables. 6 ref.

8075* Rapid Demonstration of Yeast-Cell Activity in Pressure-Stored Refrigerated Fruit Juice. V. T. Walkley. *Journal of the Science of Food and Agriculture,* v. 5, Feb. 1954, p. 99-103.

Method for routine plant control in detection of incipient yeast-cell spoilage in pressure-stored refrigerated fruit juice. Tables. 1 ref.

8076* An Experimental Comparison of Self-Consistency Tests. I. D. Sheppard. *Laboratory Practice,* v. 3, Feb. 1954, p. 53-57.

Primarily concerned with assessments of firmness in cheese grading. Graphs, table. 13 ref. (To be concluded.)

8077* Air Leakage and Gas Concentrations in Commercial Fruit Storages. G. F. Sainsbury and Fisk Gerhardt. *Refrigerating Engineering,* v. 62, Mar. 1954, p. 61-66, 111-112, 114.

Amounts of CO_2 and fruit volatiles in storage plants measured. Costs of air purification methods evaluated. Photograph, tables, graphs. 15 ref.

8078* Poisonous Fishes and Ichthyosarcotoxism. Their Relationship to the Armed Forces. Bruce W. Halstead and W. M. Lively, Jr. *U. S. Armed Forces Medical Journal,* v. 5, Feb. 1954, p. 157-175.

Case histories of serious illness or death resulting from fish poisoning. Photographs. 43 ref.

Books and Miscellaneous Publications

8079 Foodstuffs: Their Plasticity, Fluidity and Consistency. G. W. Scott Blair, editor. Monograph Series on the Rheological Behavior of Natural and Synthetic Products. 264 p. 1953. Interscience Publishers, Inc., N. Y. (TP 370 Sco86f)

Contains chapters on rheology of starch, cereals, milk, ice

cream, cream, cheese, honey, and certain miscellaneous food products; consistency of butter; and psycho-rheology of foodstuffs.

See also:
7643 (foreign fats in dairy products)
8297 (polyethylene for citrus fruit)

FUELS AND COMBUSTION

8080 Low-Temperature Thermal Data for the Nine Normal Paraffin Hydrocarbons From Octane to Hexadecane. H. L. Finke, M. E. Gross, Guy Waddington, and H. M. Huffman. *American Chemical Society, Journal*, v. 76, Jan. 20, 1954, p. 333-341.

Includes graphs, tables. 15 ref.

8081* Recent Advances in Infra-Red Spectroscopy. J. K. Brown. *British Coal Utilization Research Association, Monthly Bulletin*, v. 17, Nov. 1953, p. 449-464.

Spectroscope identifies unknown substances and plays part in researches into nature of coals. 232 ref.

8082* A Rational Scientific Classification of Coal. (German.) W. Francis. *Brennstoff-Chemie*, v. 34, nos. 21-22, Nov. 18, 1953, p. 321-330.

Classification system based on values of elementary analysis of humins and chemical composition. Tables, diagrams. 15 ref.

8083* The Effect of the Addition of Fuel Oil During Coking. (German.) Wolfram Ohme. *Brennstoff-Chemie*, v. 34, nos. 21-22, Nov. 18, 1953, p. 338-340.

Shows advantage of addition of 5% fuel oil to coking coal.

8084* Development of Powdered Coal Gasification According to Koppers-Totzek and Its Success in the Large Plant. (German.) Friedrich Totzek. *Brennstoff-Chemie*, v. 34, nos. 23-24, Dec. 16, 1953, p. 361-367.

History of coal gasification, successful modern plants, and their results. Diagrams, graph, tables, photographs. 5 ref.

8085* Composition and Washing of Crude Benzol From Coking Gas. (German.) G. Wunderlich. *Brennstoff-Chemie*, v. 34, nos. 23-24, Dec. 16, 1953, p. 367-373.

Equilibria of washing process with wash oil for devising wash oil-crude benzol nomograms. Tables, graphs. 10 ref.

8086* Chemico-Physical and Petrographic Investigation of Coals, Cokes, and Graphites. VI. Investigation on Reflectance and Reflection Anisotropy of Vitrinites. (German.) Erhard Wege. *Brennstoff-Chemie*, v. 35, nos. 1-2, Jan. 20, 1954, p. 1-6.

Design and operation of improved slit microphotometer for determining degree of carbonization of coal by measuring its reflectance. Diagrams, graphs, tables. 12 ref.

8087* Methane Sorption of Mineral Coal. (German.) Franz Beckmann. *Brennstoff-Chemie*, v. 35, nos. 1-2, Jan. 20, 1954, p. 6-14.

Method of determining absorption of CH_4 in coal as a function of its petrographic composition and degree of carbonization. Tables, graphs, diagram. 6 ref.

8088* Investigation on Behavior of Coals When Heated in a Stream of Oxygen. (A Contribution to the Problem of Spontaneous Ignition of Coal). (German.) Hildegard Schroeder. *Brennstoff-Chemie*, v. 35, nos. 1-2, Jan. 20, 1954, p. 14-23.

A review. Shows dependence of ignition temperature on grain size, layer thickness, volatile constituents, and preliminary oxidation. Tables, graphs, micrographs, diagram. 31 ref.

8089* Utilization of Several Fuels in One Boiler. (French.) J. Fafournoux. *Chaleur & Industrie*, v. 34, no. 341, Dec. 1953, p. 339-349.

Includes tables, graphs, diagrams. (To be continued.)

8090* Are Results of Investigations Concerning Reactivity of Coke-Type Fuels Industrially Applicable at Present Time? (French.) Henry Cassan. *Chaleur & Industrie*, v. 34, no. 341, Dec. 1953, p. 357-370.

Reactivity as function of temperature. Graphs, tables. (To be continued.)

8091* Comparison Between Different Methods of Determining the True Temperature and the Emission Factor of Luminous Flames. (French.) L. Charpenet. *Chaleur & Industrie*, v. 35, no. 342, Jan. 1954, p. 3-9.

Compares reference-optic, cinematographic, and electronic methods. Photographs, tables, graphs. 9 ref.

8092* Fuels and Their Combustion. VI. (French.) Roger Martin. *Chaleur & Industrie*, v. 35, no. 342, Jan. 1954, p. 10-20.

Use of combustion diagrams. (To be continued.)

8093 Reactions in Turbulent Free Jets. The Turbulent Diffusion Flame. Thomas Baron. *Chemical Engineering Progress*, v. 50, Feb. 1954, p. 73-76.

Mathematical technique as a summary and extrapolation of the body of experimental information available on free jets. 8 ref.

8094* Industrial Gas Burners. (German.) R. Pistor. *Chemie-Ingenieur-Technik*, v. 26, no. 4, Apr. 1954, p. 206-220.

Burners and flames used in chemical industry. Graphs, diagrams, tables, photographs. 75 ref.

8095* International Methods of Coal Analysis. J. G. King. *Coke and Gas*, v. 16, Feb. 1954, p. 55-60.

Reviews most recent discussions and decisions of International Standards Organization on the subject of coal analysis. Table.

8096* Thermographic Investigation of Humic Acids of Coals. (Russian.) B. K. Klimov, T. A. Kukharenko, and K. I. Chibisova. *Doklady Akademii Nauk SSSR*, v. 92, no. 5, Oct. 11, 1953, p. 963-966.

Humic acids studied from 150 to 850 C. Graphs. 8 ref.

8097* A Method for the Petrographic Analysis of Commercially Delivered Lignite. Alfred Traverse. *Economic Geology*, v. 49, Jan.-Feb. 1954, p. 92-100.

Technique for preparing thin sections of samples of crushed lignite by embedding particles in plaster of Paris with a plastic resin binder and then using conventional polishing techniques. Tables, graphs, micrograph. 4 ref.

8098 The Explosion and Decomposition of Methyl Nitrate in the Gas Phase. Peter Gray and G. T. Rogers. *Faraday Society, Transactions*, v. 50, Jan. 1954, p. 28-36.

Experiments on spontaneous (explosive) ignition of gaseous methyl nitrate. Tables, graphs, diagrams. 17 ref.

8099* Monthly Thermal Balance Sheet of a Boiler Room Operating With Powdered Lignite. (French.) D. Pieramati and A. Sevoz. *Flamme et Thermique*, v. 7, no. 64, Jan. 1954, p. 31-39, 41.

Technical Organization for the Utilization of Energy (France) sponsors study on use of low grade fuels. Tables.

8100* The Structure of a Bituminous Coal From the Properties of Bitumens and Pseudo-Bitumens. (Japanese.) Tsutomu Sakabe, Katsuya Inouye, Koji Ouchi, and Hidemasa Honda. *Fuel Society of Japan, Journal*, v. 32, no. 319, Nov. 1953, p. 610-626.

Includes tables, graphs. 34 ref.

8101* Magnetochemical Aspects on Petrographical Constituents of Coal. (Japanese.) Hidemasa Honda, Hideo Kimura, and Koji Ouchi. *Fuel Society of Japan, Journal*, v. 32, no. 320, Dec. 1953, p. 669-681.

Petrographical analyses of coal constituents separated by float-and-sink method are compared with densities; proximate and ultimate analyses; calorific values; and magnetochemical constants. Graphs, tables. 4 ref.

8102* Study on the Plastic Properties of Japanese Coal by Means of Gas Flow Method and K.B.S. Method. (Japanese.) Takao Iwasaki, Seiichi Nomura, Keiichiro Hayakawa,

Fuels and Combustion

and Masayuki Uchino. *Fuel Society of Japan, Journal*, v. 32, no. 320, Dec. 1953, p. 688-697.

Includes diagram, tables, graphs. 8 ref.

8103* Town Gas Production. A. F. Cottrell and T. W. Austen. *Gas Journal*, v. 277, Feb. 3, 1954, p. 282-286.

Economics of production and automation processes. Tables.

8104* Use of Liquid Gas for Maximum Performance. (German.) Paul Schenk and Willi Zankl. *Gas und Wasserfach*, v. 95, Ausgabe Gas, no. 1, Jan. 1, 1954, p. 11-14.

Gas made by mixing liquid with other gases. Thermal cracking of liquid gas. Tables, diagram, photograph. 2 ref. (To be continued.)

8105 Low Temperature Carbonization Rates in a Fluidized Bed. H. Nathan Stone, James D. Batchelor, and H. F. Johnstone. *Industrial and Engineering Chemistry*, v. 46, Feb. 1954, p. 274-278.

Results of study in which rates of initial carbonization reactions were measured in a fluidized bed at temperatures from 770 to 1125 F. Diagrams, tables, graphs. 16 ref.

8106* Comparison of Five Methods for Mechanical Testing of Cokes. (French.) Ch. G. Thibaut. *Institut de Recherches de la Sidérurgie, Publications*, ser. A, no. 62, Nov. 1953, 65 p. (TS300 In7p)

Shows Mission Interalliée de Controle des Usines et des Mines test to be adequate. Tables, graphs, diagrams. 30 ref.

8107 Some Aspects of Coal Pyrolysis. Charles Ellis. *Institution of Gas Engineers, Copyright Publication no.* 436, 1953, 17 p. (TP700 In7.3c)

Changes that occur in coal when heated in four regions from 300 to 3000 C. Tables, graphs.

8108 Flame Zone Studies by the Particle Track Technique. I. Apparatus and Technique. R. M. Fristrom, W. H. Avery, R. Prescott, and A. Mattuck. *Journal of Chemical Physics*, v. 22, Jan. 1954, p. 106-109.

Flame temperature profiles of laminar premixed Bunsen flames by particle track method. Graph, table, diagrams. 14 ref.

8109 Synethesis and Physical Properties of Several Acetylenic Hydrocarbnos. Philip Pomerantz, Abraham Fookson, Thomas W. Mears, Simon Rothberg, and Frank L. Howard. *Journal of Research, National Bureau of Standards*, v. 52, Feb. 1954, p. 51-58.

Includes tables. 17 ref.

8110* Smokeless Combustion of Shale. (Russian.) Kh. K. Truu. *Priroda*, v. 43, no. 2, Feb. 1954, p. 84-86.

Installation consists of a two-stage burner. First stage is a gas generator, second stage a condenser. Micrographs.

8111* Method of Analyzing Gasoline by Hydrocarbon Families. (French.) L. Robert and A. Crozier. *Revue de l'institut francais du petrole et Annales des combustibles liquids*, v. 8, no. 11, Nov. 1953, p. 545-549 + 6 plates.

Simple and fairly rapid method for characterization of gasolines. Gives distribution of chemical families versus distillate percentages. Tables, graphs. 21 ref.

8112* Research and Development on the Conversion of Coal to Gas, Liquid Fuels, and Bulk Organic Chemicals. H. H. Storch. *South African Mining and Engineering Journal*, v. 64, pt. 2, Jan. 30, 1954, p. 791, 793, 795, 797.

Survey of recent discoveries relating to chemical structure of coal; specialized processes such as bulk organic chemicals by hydrogenation; synthesis gas, high-B.t.u. gas, and liquid fuels; and chemicals from hydrogenation of CO. Tables. 11 ref.

8113 Carbonizing Procedures With New Experimental Coke Oven. John B. Gayle and E. L. Gulledge. *U. S. Bureau of Mines, Report of Investigation* 5011, Jan. 1954, 11 p. (TN21 Un3r)

Oven design, operating characteristics, and results of first series of carbonizing tests on Alabama coals. Tables, graph. 2 ref.

8114* The Spherical Expansion of the Detonation in Acetylene-Air Mixtures. (German.) Heinz Freiwald and Hans Ude. *Zeitschrift für Elektrochemie*, v. 57, no. 8, 1953, p. 629-632.

Photographic recordings prove that detonation of an acetylene-gas-filled balloon, ignited in the center, expands in a spherical fashion. Photographs, diagram. 8 ref.

8115* Primary and Secondary Reactions in the Water-Vapor Gasification of Coal. (German.) E. Wicke and M. Rossberg. *Zeitschrift für Elektrochemie*, v. 57, no. 8, 1953, p. 641-645.

Experiments at 1000 to 1400 C and 0.15 to 1 atmosphere. Diagrams, graphs, table. 16 ref.

8116* Investigation of Combustion Conditions of Gas Mixtures. XXIV. Cold-Flame Oxidation of Propane. M. I. Gerber and M. B. Neiman. **XXV. Cold-Flame Oxidation of Butene.** (Russian.) A. A. Dobrinskaia, M. B. Neiman, and N. K. Rudnevskii. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 11, Nov. 1953, p. 1617-1630.

Includes tables, graphs. 38 ref.

Books and Miscellaneous Publications

8117 Flames. Their Structure, Radiation, and Temperature. A. G. Gaydon and H. G. Wolfhard. 340 p. 1953. Chapman & Hall, Ltd., London. (QD516 G25f)

Presents underlying physical processes occuring in flames. Especially concentrates on measurement of flame velocity; theories of flame propagation; method of carbon formation in flames; flame radiation; measurement of high flame temperatures; and ionization in flames.

8118 Pilot Plant Catalytic Gasification of Hydrocarbons. C. H. Riesz, P. C. Lurie, C. L. Tsaros, and E. S. Pettyjohn. Institute of Gas Technology Research Bulletin 6, July 1953, 44 p. (TP700 In7r)

Investigates catalytic cracking of hydrocarbons in presence of steam and air as method of producing substitutes for various utility gases. Tables, graphs, photographs, diagrams. 16 ref.

8119 Fluid Gasification of Oil. J. M. Reid, W. J. Merwin, C. G. von Fredersdorff, H. R. Linden, and E. S. Pettyjohn. Institute of Gas Technology Research Bulletin 16, Nov. 1953, 48 p. (TP700 In7r)

Experimental data and observations on application of fluid cracking techniques to high-B.t.u. oil gas manufacture. Tables, graphs, diagrams, photographs. 9 ref.

See also:

7587 (coal utilization)
7621 (analysis of coal hydrogenation oils)
7640 (abosrption speed of CO gases)
7680 (composition of coal tars)
7825 (effects of processing variables on can corrosion)
8121 (petrography of coal and coke)
8383 (heating open-hearth furnace with methane—fuel oil)

GEOLOGY AND MINERALOGY

8120* Geology of Ham Gossett Oil Field, Kaufman County, Texas. Peter N. Wiggins, III. *American Association of Petroleum Geologists, Bulletin*, v. 38, Feb. 1954, p. 306-318.

There is more subsurface control through entire Cretaceous section than anywhere else along Mexia-Talco fault zone. Tables, maps, graph. 6 ref.

8121* Chemico-Physical and Petrographic Investigations on Coals, Cokes, and Graphites. VI. Investigations on the Reflectance and the Reflection Anisotropy of Vitrinites. (German.) Erhard Wege. *Brennstoff-Chemie*, v. 35, nos. 3-4, Feb. 17, 1954, p. 33-41.

Reflectance and structural parts of coal, effect of various factors on reflectance, and phenomenon of reflection anisotropy. Tables, charts, graphs. 34 ref.

8122* Pitchblende Deposits of the Saint Louis Fault. R. B. Allen, B. C. MacDonald, and E. E. N. Smith. *Canadian Mining and Metallurgical Bulletin*, v. 47, no. 502, Feb. 1954, p. 67-70;

disc., p. 70; *Canadian Institute of Mining and Metallurgy, Transactions*, v. 57, 1954, p. 41-44.

Location, regional geology, and mining history. Table.

8123* New Discovery of Ilvaite in Copper-Nickel Sulfide Ores. (Russian.) G. I. Gorbunov and N. A. Kornilov. *Doklady Akademii Nauk SSSR*, v. 94, no. 2, Jan. 11, 1954, p. 323-325 + 1 plate.

Optical properties, X-ray analysis, and interrelationship with sulfides and other material. Table, micrographs. 2 ref.

8124* Manganese Deposits of the Mogollon Rim, Coconino County, Arizona. Caswell Silver. *Economic Geology*, v. 49, Jan.-Feb. 1954, p. 88-91.

Deposits consist of hard black MnO_2 mineral fragments in residual soil and clay mantle, of fracture-filled veins and bedded replacement in top of Coconino sandstone country rock, and of associated derived colluvial material. Diagram. 2 ref.

8125 The Tides of the Solid Earth and Their Geophysical and Geological Significance. R. Tomaschek. *Nature*, v. 173, Jan. 23, 1954, p. 143-145.

Includes tables, diagram, map. 9 ref.

8126* Progress in Electric Logging Research at the Pennsylvania State University During 1952-1953. Charles R. Holmes. *Producers Monthly*, v. 18, Jan. 1954, p. 33-38.

Three phases of the logging research program for the past year are reviewed. Evaluation of effects of related parameters on measurement of core resistance in the laboratory; investigation of resistance variation with water saturation of especially prepared Bradford sand cores; and study of effect of load and formation pressures on electrical properties of oil bearing rocks. Photographs, graphs, diagrams. 3 ref.

8127* Natural Gas Search Booms in Intermountain West. Bob Bernick. *World Oil*, v. 138, Mar. 1954, p. 66-69.

Possible sources of natural gas supply for West Coast. Map.

8128* Southeastern Colorado Gas Developments Enhance Prospects. Anthony Gibbon. *World Oil*, v. 138, Mar. 1954, p. 101-104, 107.

Digest from "Permian and Pennsylvanian Rocks of Southeastern Colorado", J. C. Maher. Geological study of occurrence. Maps, table. 1 ref.

8129* Processing Microstructural Diagrams. (Russian.) A. B. Vistelius. *Zapiski Vsesoiuznogo Mineralogicheskogo Obshchestva*, v. 82, no. 4, 1953, p. 271-280.

Corrects and supplements Schmidts' petrographical method. Permits obtaining of more precise and comprehensive results. Graphs, diagram, tables. 7 ref.

Books and Miscellaneous Publications

8130 The Origin of the Earth. W. M. Smart. 239 p. 1953. University Press, Cambridge. (QE501 Sm29o)

Book is primarily intended as a record of scientific investigations of astronomy, physics, chemistry, geology, and biology.

8131 Reviews of Research on Arid Zone Hydrology. 212 p. 1953. UNESCO, Paris. (QH88 Un2r)

"The Problem of Water Resources in North-West Africa", Georges Drouhin; "Research in Hydrology and Fluid Mechanics and Developmnet of Underground Water in the Arid Regions of North-East Africa", Y. M. Simaika; "Hydrological Research in Arid and Semi-Arid Areas in the Union of South Africa and Angola", H. F. Frommurze; "Hydrological Research in the Middle East", Nazmi Karatekin; "Hydrological Research in the Arid and Semi-Arid Areas of India and Pakistan", R. D. Dhir; "Report on the Hydrological Problems of the Arid and Semi-Arid Areas of the United States and Canada", Ray K. Linsley; "Hydrology and Utilization of Hydraulic Resources in the Arid and Semi-Arid Areas of Latin America", Guillermo A. Fernandez de Lara; "The Hydrology of Arid and Sub Arid Australia With Special Reference to Underground Water", E. Sherbon Hills; and "World Distribution of Arid and Semi-Arid Homoclimates", Peveril Meigs.

GEOPHYSICS

8132* Plasma Theory of the Ionosphere. (German.) Ilse Lucas and Arnulf Schlüter. *Archiv der elektrischen Übertragung*, v. 8, no. 1, Jan. 1954, p. 27-30.

Basic equations for dynamic and electrical behavior of the ionosphere were derived from known theory of a plasma with natural gas. Equations are specialized for application to problem of tides. Table. 7 ref.

8133* Galactic Radiation at Radio Frequencies. V. The Sea Interferometer. J. G. Bolton and O. B. Slee. **VI. Low Altitude Scintillations of the Discrete Sources.** J. G. Bolton, O. B. Slee, and G. J. Stanley. *Australian Journal of Physics*, v. 6, Dec. 1953, p. 420-451.

Factors involved in study of discrete sources of galactic noise by the sea interferometer. Study of scintillations of four discrete sources of altitudes of from 0 to 10°. Graphs, diagrams, tables. 16 ref.

8134* The Radio Brightuness Distributions Over Four Discrete Sources of Cosmic Noise. B. Y. Mills. *Australian Journal of Physics*, v. 6, Dec. 1953, p. 452-470 + 2 plates.

Results using two-aerial interferometer of a special type, in which aerial spacing and azimuth angle of the axis may be varied over a wide range. Tables, graphs, photographs, diagrams. 21 ref.

8135* Investigation on Propagation of Visible and Infrared Light Through Fog and Mist. (French.) Albert Arnulf, Jean Bricard, and Claude Veret. *Comptes rendus*, v. 238, no. 4, Jan. 25, 1954, p. 503-505.

Energies transmitted through atmosphere are compared under controlled conditions. Graphs. 6 ref.

8136 Absorption Coefficients of Several Atmospheric Gases. K. Watanabe, Murray Zelikoff, and Edward C. Y. Inn. *Geophysics Research Directorate Geophysical Research Paper no. 21, Air Force Cambridge Research Center Technical Report* 53-23, June 1953, 79 p. (QC806 Un3g)

Coefficients of various gases measured in spectral region from 1050 to 2500 A. Tables, graphs, diagrams. 121 ref.

8137 Forecasting Relationships Between Upper Level Flow and Surface Meteorological Processes. J. J. George, R. D. Roche, H. B. Visscher, R. J. Shafer, P. W. Funke, W. R. Biggers, and R. M. Whiting. *Geophysics Research Directorate Geophysical Research Paper no. 23, Air Force Cambridge Research Center Technical Report* 53-28, Aug. 1953, 186 p. (QC806 Un3g)

Empirical methods of practical forecasting designed and developed for use in prediction of cyclogenesis in eastern U.S. Discusses track, speed, and future intensity for certain classes of cyclones; speed and track of cold anticyclones; and 24 hr. future position of cold fronts. Tables, diagrams. 10 ref.

8138 Rocket Measurements of Upper Atmosphere Ambient Temperature and Pressure in the 30- to 75-Kilometer Region. H. S. Sicinski, N. W. Spencer, and W. G. Dow. *Journal of Applied Physics*, v. 25, Feb. 1954, p. 161-168.

Method determines ambient temperature and pressure in upper atmosphere, using properties of supersonic flow field surrounding a right circular cone. Graphs, diagrams. 15 ref.

8139* Excitation Processes in the Aurora and Airglow. I. Absolute Intensities, Relative Ultra-Violet Intensities and Electron Densities in High Latitude Aurorae. II. Exciation of Forbidden Atomic Lines in High Latitude Aurorae. M. J. Seaton. *Journal of Atmospheric and Terrestrial Physics*, v. 4, Jan. 1954, p. 285-313.

Seeks information best suited to study physical processes. Summary of various excitation and deactivation processes. Tables, graphs. 80 ref.

8140* The Variation of Electrical Conductivity of Air Within Sealed Rooms. L. G. Smith and G. F. Schilling. *Journal of Atmospheric and Terrestrial Physics*, v. 4, Jan. 1954, p. 314-321.

New approach to investigations of ion-equilibrium in atmosphere. Tables, graph. 5 ref.

Geophysics

8141 Chemistry in the Stratosphere and Upper Atmosphere. Lewis E. Miller. *Journal of Chemical Education*, v. 31, Mar. 1954, p. 112-124.

Nomenclature, composition, and physical properties. Diagram, tables, photographs, graphs, spectrogram. 43 ref.

8142* Magellanic Clouds. X. An Evaluation of the Zero Point Correction. Harlow Shapley and Virginia McKibben Nail. *National Academy of Sciences of the United States of America, Proceedings*, v. 40, Jan. 1954, p. 1-5.

Presents total magnitudes of 13 clusters that, on the grounds of spectral class, color, and structure, appear to be typically globular and comparable in all respects to the globular clusters of our own galactic system. Tables. 11 ref.

8143* Study of the Fauna in the Kyrillo-Kamchatian Depression. (Russian.) L. A. Zenkevich, Ia. A. Birshtein, and G. M. Beliaev. *Priroda*, v. 43, no. 2, Feb. 1954, p. 61-74 + 1 plate.

Animal life was found in depths of over 9950 m. Drawings, photographs, tables.

8144 Modern Cosmology. George Gamow. *Scientific American*, v. 190, Mar. 1954, p. 54-63.

Theory utilizes evidence from decay of atoms, metabolism of stars, and flight of galaxies to describe structure of the Universe in space and time. Diagrams, spectrograms, photographs.

8145 Magnetic Storms, Aurorae, Ionosphere and Zodiacal Light. Edward O. Hulburt. *Scientific Monthly*, v. 78, Feb. 1954, p. 100-109.

Based on address at AAAS meeting, Boston, Dec. 1953. Theory and discussion. Photograph, drawing, diagrams. 31 ref.

See also:
7501 (cause of "red tide").

GRAPHIC ARTS

8146* NPIRI Standard Method for Tinting Strength. William C. Walker. *American Ink Maker*, v. 32, Feb. 1954, p. 25-27, 63.

Evaluating printing ink pigments. Tables. 4 ref.

8147* The Technology of the Phthalocyanines. II. Their Application. Robert E. Brouillard. *American Ink Maker*, v. 32, Feb. 1954, p. 30-33, 65, 67.

Based on talk presented at a meeting of the New York Pigment Club, Dec. 1953. Pigmentary, textile, and miscellaneous applications. Diagrams. 78 ref.

8148* Quick Dry Ink and Ball Point Pens. I-II. David E. Gould. *American Ink Maker*, v. 32, Feb., p. 34-37, 65; Mar. 1954, p. 38-40, 69.

Testing methods; permanency; physical and chemical properties of various inks.

8149* The Impact of Photographic Type Composition on the Graphic Arts. Frank Sherman. *American Pressman*, v. 64, Feb. 1954, p. 34-37.

Fotosetter, Monophoto, and Photon processes. Photographs, diagram.

8150* Typesetting by Photolithography. *American Printer*, v. 135, May 1954, p. 30-31, 54B-54D.

Uses linofilm, Photon, Monophoto and ATF's Hadego processes. Photographs.

8151* Generalized Equation for the Transformation Function of Blackening. (Russian.) E. E. Vainshtein. *Doklady Akademii Nauk SSSR*, v. 92, no. 4, Oct. 1, 1953, p. 723-725.

Generalized expression for blackening functions used to "straighten out" characteristic curves of emulsions. 8 ref.

8152* Rotogravure Cylinder Engraving. I. "Conventional" Gravure. Elmer G. Stacy. *Graphic Arts Monthly*, v. 26, Feb. 1954, p. 18, 20, 22, 24.

Follows the cylinder engraver about the shop from start to finish of a job.

8153* Print Mounting, Methods and Materials. II. Wet Mounting. Irwin Welcher. *International Blue Printer*, v. 27, Feb. 1954, p. 33-35.

Standard methods of handling all large size prints and all types of mounting materials. Photographs.

8154 The Theory of Radioactive Ion Exchange. E. Pitts. *Journal of Chemical Physics*, v. 22, Jan. 1954, p. 56-65.

Experiments and theory on bromide-ion mobility in emulsions. Graphs, table. 4 ref.

8155* Etching for Dry Offset. R. B. Fishenden. *Modern Lithographer and Offset Printer*, v. 50, Jan. 1954, p. 19-20.

Equipment and techniques employed.

8156* Varnishing by Roll Coating. III. Drying, Curing and Fusing. H. Audino. *Modern Lithography*, v. 22, Feb. 1954, p. 40-42, 115.

8157* Academic Lithography. Copy Preparation Is the Key. II. Haviland F. Reves. *Modern Lithography*, v. 22, Feb. 1954, p. 44-46, 111, 113.

Problems of sales promotion and copy preparation. Photographs. (To be continued.)

8158* Preventive Maintenance. Editorial. Harris W. C. Browne. *National Lithography*, v. 61, Feb. 1954, p. 25-40, 42-44.

Maintenance issue includes "The Care and Storage of Chemicals", Russ Waddell; "A Whirler Speaks", W. A. Brown; "The Care and Storage of Offset Inks", R. S. Shepherd; "Day-to-Day Care of Paper Cutters", Nicholas Herman; "The Handling of Chemicals", Milton C. Kintsler; "The Handling and Storage of Paper", W. Keith Gainer; "Day-to-Day Care of Offset Presses", A. W. Sejeck; "Day-to-Day Care of Offset Blankets", Jack Young; "Day-to-Day Care of Photo-Composers", B. R. Halpern; "The Care and Storage of Offset Inks", Herbert H. Krause; and "One Problem of Offset", Charles F. Geese.

8159 Subtractive Color Photography: The Role of Masks. W. T. Hanson, Jr. and W. Lyle Brewer. *Optical Society of America, Journal*, v. 44, Feb. 1954, p. 129-134.

Masks can be applied in such a manner as to minimize color-reproduction errors in a photographic process, regardless of source of these errors. Table, graphs. 7 ref.

8160* Experiments With Thin Films of Silver Sulphide, Silver and Gold. J. H. Burrow and J. W. Mitchell. *Philosophical Magazine*, v. 45, 7th ser., no. 361, Feb. 1954, p. 208-222.

Experimental work on reaction between Br and thin films of Ag_2S; and on composite thin films of Ag_2S with Ag and Au. 22 ref.

8161 A Novel Photographic Technique for Preparing Halftone Masters for Diazotype Reproduction. H. Carl How. *Photographic Science and Technique*, ser. 2, v. 1, no. 1, Feb. 1954, p. 13-16.

Step by step laboratory procedure of exposure, printing, and development. Table, diagrams, photographs.

8162 Time-Lapse Cameras and Their Industrial Uses. John R. Huffman. *Photographic Science and Technique*, ser. 2, v. 1, no. 1, Feb. 1954, p. 20-22.

Micro-motion pictures utilized by industrial engineers to record and time human motions performed too rapidly for on-the-spot, visual evaluation. Photographs. 4 ref.

8163 The Application of Radiative Transfer Theory to Scattering Effects in Unexposed Photographic Emulsions. E. Pitts. *Physical Society, Proceedings*, v. 67, no. 410B, Feb. 1954, p. 105-119.

Transmission of light through a medium containing many particles which scatter and absorb light. Graphs, tables. 8 ref.

8164* The ABC of Offset. XIX. Correcting the Halftone Positive. George Jos. Lenzer. *Printing Equipment Engineer*, v. 84, Feb. 1954, p. 49-50.

Includes tables. 5 ref. (To be continued.)

8165* Break-Even Charts. F. B. Bossert. *Printing Magazine*, v. 78, Feb. 1954, p. 56-58.

Method shows effect of changes in operating conditions by con-

verting production data into significant dollar figures. Charts, table.

8166* Common Causes of 'Streaking'. J. W. McGanley. *Printing Magazine*, v. 78, Feb. 1954, p. 59, 76.

Types of streaking and suggested remedies.

See also:
7738 (photographic chemistry)
7926 (electronic printer)
8233 (shutter tester)
8240 (camera for explosive phenomena studies)
8840 (thermoplastic printing)
8960 (textile printing)

HEAT POWER

8167* Breaks in Ship Boiler Tubes. Studies Conducted in the Instituto Nacional de Tecnologia (Rio de Janiero) for the Purpose of Discovering Their Causes. (Portuguese.) A. H. da Silveira Feijó, Silvia Maurell Lobo Radino, Maria Regina Veloso da Silveira, Enio Goulart de Andrade, and Hugo Lodewijk Radino. *ABM (Boletim da associacao brasileira de metais)*, v. 9, no. 32, July 1953, p. 366-381.

Overheating was shown to be principal factor. Outlines steps for prevention. Photographs, tables, graphs, micrographs.

8168 General Electric J47. R. E. Small. *Aero Digest*, v. 68, Feb. 1954, p. 28-32.

First detailed analysis of world's most widely used turbojet engine. Diagrams, photographs.

8169 Small Turbines, Heart of Accessory Power Systems. L. W. Biwer and R. L. McManus. *Aero Digest*, v. 68, Feb. 1954, p. 52, 54, 56.

New air-turbine design eliminates engine-driven systems for power, refrigeration, and movement of fluids. Drawings.

8170 Effect of Gasoline Volatility on the Performance of Passenger Cars. C. J. Domke, C. B. Tracy, and H. R. Taliaferro. *American Petroleum Institute, Proceedings*, sec. III, v. 33, 1953, p. 112-115; disc., p. 115-116.

Effects of fuel volatility on engine starting time, warm up, and vapor lock. Tables, graphs, diagram. 12 ref.

8171 Engine Deposits and Wear. C. M. Larson. *American Petroleum Institute, Proceedings*, sec. III, v. 33, 1953, p. 207-215.

Road and laboratory engine tests determine detergency necessary in motor oil to keep deposits, wear, and oil consumption to a minimum. Photographs, graphs, tables.

8172* Measurements on Condensers and Gas Turbines. IV. Condenser Measurements. (German.) Wilfried Oesterlin. *Archiv für technisches Messen*, 1953, no. 214, Nov., p. 251-254.

Importance of capacity measurements on condensers. Various methods of measuring direction of flow, oscillation, and turbulence. Graphs, diagrams, photographs. 100 ref.

8173 The Elastic-Fluid Centripetal Turbine for High Specific Outputs. Rudolph Birman. *ASME, Transactions*, v. 76, Feb. 1954, p. 173-185; disc., p. 185-187.

It is shown by drawings, photographs, test results, and numerical examples, that centripetal turbine can be designed to handle larger flows and higher enthalpy drops at higher r.p.m. with better efficiency and lower stresses than axial-flow turbine. Very high specific outputs permit solution of problems which cannot be designed by axial-flow wheel. Diagrams, graphs, photographs, table.

8173a* The Effect of Flight Altitude Upon Preparation of the Mixture and Combustion. (German.) Eugen Sänger. *Brennstoff-Chemie*, v. 35, nos. 3-4, Feb. 17, 1954, p. 41-44.

Effects of decreasing air density, temperature, and pressure. Method increases efficiency of combustion at high altitudes. Charts. 4 ref.

8174 Build Successful Jet Engine Test Cell With Refractory Blocks. David G. Bolan. *Brick & Clay Record*, v. 124, Feb. 1954, p. 65-67.

Refractory chamber built to contain engine blasts. Temperatures to 500 F under thrust of 200 m.p.h. forced through refractory testing baffles. Blocks are heated to 500 F in 20 sec. Photographs, diagram.

8175* Operating Experience With Brown Boveri Gas-Turbine Installations. H. Pfenninger. *Brown Boveri Review*, v. 40, nos. 5-6, May-June 1953, p. 144-166.

In many cases it is more advantageous to employ a gas turbine than a steam turbine or oil engine plant. Photographs, diagrams, tables, graphs. 9 ref.

8176* The Determination of Optimum Compressor and Turbine Temperature Ratios for Two-Shaft Gas-Turbine Installations. H. Baumann. *Brown Boveri Review*, v. 40, nos. 5-6, May-June 1953, p. 178-189.

Includes graphs, diagrams.

8177* The Determination of Temperature Distribution in Gas Turbine Rotor Bodies and Cylinders by the Electrolytic Tank Method. H. Baumann. *Brown Boveri Review*, v. 40, nos. 5-6, May-June 1953, p. 189-196.

Includes diagrams, graphs, photograph. 5 ref.

8178 Control of Fuel Oil Ash Deposits in Gas Turbines by Making Additions to Fuel Oil. P. T. Sulzer. *Henry Brutcher, Altadena, Calif., Translation no.* 3082, 3 p. (From *Schweizer Archiv*, v. 18, no. 11, 1952, p. 379-380.)

Preliminary results of experiments on minimizing deposits of oil ash on turbine blades and other turbine parts. Photographs. 4 ref.

8179* Use of Several Fuels in a Boiler. (French.) J. Fafournoux. *Chaleur & Industrie*, v. 35, no. 342, Jan. 1954, p. 21-36.

Combustion of gaseous fuels; special problems in use of blast-furnace gas; relation between nature of fuels, design of boiler and volume of combustion chamber; distribution of temperatures in a boiler and relation between nature of fuel and superheating; control of combustion; and safety devices for oil- or gas-burning boilers. Tables, graphs, diagrams. 20 ref.

8180* High Temperature Turbine Machinery for Marine Propulsion. II. Gas Turbines. T. W. F. Brown. *Engineer*, v. 197, Jan. 29, 1954, p. 158-161.

Based on paper presented at Inst. of Mech. Engr., Jan. 1954, England. Cooled gas turbine was studied and shown to have greater potentialities for improvement than the steam turbine. Tables, photographs, graphs, diagrams. (To be continued.)

8181* Gas-Turbines at Beznau Power Station. E. A. Kerez. *Engineering*, v. 177, Jan. 29, 1954, p. 146-147.

Operating experience at the largest gas-turbine power station. Diagram.

8182* The Circumferential Efficiency of Axial-Flow Turbomachines. (German.) H. Linnecken. *Forschung auf dem Gebiete des Ingenieurwesens*, v. 19, Ausgabe B, no. 4, 1953, p. 97-100.

Influence of inlet and outlet angle on efficiency. Diagrams, graphs.

8183* Research on Reciprocating Machines. Calculation of the Final State of Gas Intake in High-Speed Diesel Engines. (German.) Hansjoachim Brosinsky. *Forschung auf dem Gebiete des Ingenieurwesens*, v. 19, Ausgabe B, *VDI-Forschungsheft* 440, 1953, p. 23-39.

Measurements evaluate effect of variations in air inlet temperature on feed rate of self-priming diesel engine. Diagrams, tables, graphs. 13 ref.

8184* The Effect of Combustion-Chamber Shape on Smoothness of Power. Harvey L. Mantey. *General Motors Engineering Journal*, v. 1, Jan.-Feb. 1954, p. 14-19.

Combustion roughness controlled by combustion-chamber design to avoid a high rate of pressure rise by effecting a lower rate of burn. Graphs, diagrams, spectrograms. 9 ref.

8185* The Buick Air Power Carburetor. Adolph F. Braun. *General Motors Engineering Journal*, v. 1, Jan.-Feb. 1954, p. 26-31.

New design brings greater power output plus fuel economy especially at low and moderate speeds. Diagrams. 4 ref.

Heat Power

8186* Diesel Engine Improvements Through Experimentation With Fuel Injection and Combustion Chamber Relationships. Herbert H. Black. *General Motors Engineering Journal,* v. 1, Jan.-Feb. 1954, p. 32-36.

Design suggestions. Photographs, diagrams.

8187* Radiation and Furnace Design. G. J. Gollin. *Glass,* v. 31, Feb. 1954, p. 61-65, 68.

Heat transfer in boilers and furnaces. Graphs, diagrams. 13 ref.

8188* Fluid Flow in Turbo-Machinery. H. S. Fowler and V. Walker. *Institution of Engineers & Shipbuilders in Scotland, Transactions,* v. 97, pt. 3, 1953-1954, p. 113-144; disc., p. 145-152.

Value to turbo-machinery designer of air-flow tests on models of various components. Facilities for carrying out such tests. Diagrams, photographs. 7 ref.

8189 The Correlation of Interior Ballistic Data for Solid Propellants. Richard D. Geckler and David F. Sprenger. *Jet Propulsion,* v. 24, Jan.-Feb. 1954, p. 22-26.

Self-consistent set of empirical equations describe concisely the most important performance parameters of solid propellant rocket motor. Tables. 3 ref.

8190 Pressure Charged Gas Engine. *Machinery Lloyd (Overseas Ed.),* v. 26, Feb. 27, 1954, p. 79-83.

Power and thermal efficiency challenge diesel supremacy. Photographs, graphs.

8191* The Thermodynamics of Operating Gases for Atomic Rockets. (German.) Irene Sänger-Bredt. *Zeitschrift für Naturforschung,* v. 8a, no. 12, Dec. 1953, p. 796-804.

Basic problem of accelerating an operating medium heated to very high enthalpy without exceeding controlable heat transitions to tank walls. Graphs. 22 ref.

Books and Miscellaneous Publications

8192 Petroleum and Performance in Internal-Combustion Engineering. E. M. Goodger. 295 p. 1953. Butterworths Scientific Publications, London. (TP355 G61p)

Illustrates inter-relationship between properties of fuels and performance of internal-combustion engines. Attempts to cover all important petroleum-based liquid fuels, in the range from gas line to fuel oil, and to show their appropriate engine applications. Liquefied petroleum gases and substitute fuels are mentioned. Indication is given of present trends in the use of non-petroleum fuels for ramjet units and rocket motors.

8193 Official Proceedings of the 1953 Annual Meeting Master Boiler Makers' Association. 195 p. 1953. Master Boiler Makers' Assn., Albert F. Stiglmeier, Secretary, Albany 8, N. Y. (TJ281 M39o)

Discusses treatment of water and maintenance practice for boilers and air tanks on locomotives.

8194 Study and Recommendations and Methods of Treating Water for Diesel Locomotive Cooling and Steam Generator Feedwater System. H. M. Schudlich, chairman. Paper from OFFICIAL PROCEEDINGS OF THE 1953 ANNUAL MEETING MASTER BOILER MAKERS' ASSN. p. 38-44; disc., p. 44-47. 1953. Master Boilermakers' Assn., Albert F. Stiglmeier, Secretary, Albany 8, N. Y. (TJ281 M39o)

See also:
7395 (aft frames for gas turbines)
8090 (utilization of several fuels in one boiler)

INFORMATION—PREPARATION AND DISSEMINATION

8195 Preliminary Report on the Mechanical Analysis of Information by Use of the 101 Statistical Punched Card Machine. Eugene Garfield. *American Documentation,* v. 5, Jan. 1954, p. 7-12.

One approach to mechanization of information analysis, as embodied in use of the IBM-101 Electronic Statistical Machine. 5 ref.

8196 Machine Literature Searching. I. A General Approach. II. Problems in Indexing for Machine Searching. Allen Kent, M. M. Berry, and J. W. Perry. *American Documentation,* v. 5, Jan. 1954, p. 18-25.

Selection and correlation of information can be so formulated that most drudgery involved in seeking pertinent information can be performed by suitably designed automatic equipment.

8197* Engineering Reports for Water and Sewer Systems. J. Stephen Watkins. *American Water Works Association, Journal,* v. 46, Jan. 1954, p. 31-34.

Lists prime requirements. Example is given.

8198 New Tools for the Resurrection of Knowledge. *Chemical and Engineering News,* v. 32, Mar. 1, 1954, p. 866-869, 891.

Development of literature searching machine using punched cards and photoelectric scanning. Photograph, table.

8199 Engineers Can Write Better. I. H. J. Tichy. *Chemical Engineering Progress,* v. 50, Feb. 1954, p. 104-107.

Writing techniques developed by an editor of technical manuscripts.

8200 Conference on Cybernetics, Transactions, (Annual volume), v. 9, Mar. 1952, 184 p. Josiah Macy, Jr., Foundation, New York.

Includes "The Position of Humor in Human Communication", Gregory Bateson; "The Place of Emotions in the Feedback Concept", Lawrence S. Kubie; "Homeostasis", W. Ross Ashby; "Discrimination and Learning in Octopus", J. Z. Young; "Reduction of the Number of Possible Boolean Functions", John R. Bowman; "Central Excitation and Inhibition", Ralph W. Gerard; "Mechanical Chess Player", W. Ross Ashby; "Turbulence as Random Stimulation of Sense Organs", G. Evelyn Hutchinson; "Investigations on Synaptic Transmission", Walter Pitts; and "Feedback Mechanisms in Cellular Biology", Henry Quastler.

8201 Information Theory in Air Traffic Control. Edward Fritz. *Institute of Radio Engineers, Transactions, Professional Group on Aeronautical and Navigational Electronics,* PGAE-10, Dec. 1953, p. 16-20. (TK1 In6.6t)

Amount and rates of information flow and redundancy in air-ground communications at Langley Air Force Base. Diagram, graphs.

8202 How to Get Your Story Across. Marshall Sittig. *Petroleum Processing,* v. 9, Feb. 1954, p. 208-210.

Suggestions and checklist to help improve effectiveness of communications with others. Diagram.

Books and Miscellaneous Publications

8203 Information Theory and Its Engineering Applications. D. A. Bell. 138 p. 1953. Sir Isaac Pitman & Sons, Ltd., London. (TK5521 B41i)

Contains chapters on binary digit measure of information; entropy and information; band-width and signalling speed; signal-to-noise ratio; coding; practical application of the theory; and Wiener's theory of filtering.

INSTRUMENTATION AND LABORATORY APPARATUS

Errata. Item No. 707, Jan., 1954 issue: Journal title should be *"Electronic Engineering"* instead of *"Electrical Engineering"*.

Item No. 3570, May 1954 issue should show the author as Walter Bösch. Delete E. P. F. Zurich.

8204* Survey Meters and Electroscopes for Monitoring Radioactivity in Water. William J. Lacy and Bernd Kahn. *American Water Works Association, Journal,* v. 46, Jan. 1954, p. 55-65.

Evaluates methods for measuring radioactive contamination in water. Three commercially available thin-walled Geiger-Muller type β-γ survey meters were used for test purposes. Graphs, tables, photograph. 6 ref.

8205* Pneumatic Controls and Instrumentation for Water Plants. Russell H. Babcock. *American Water Works Association, Journal*, v. 46, Feb. 1954, p. 133-143.

Applications and methods of use of pneumatic transmission and control in water treatment plants. Diagrams, graph.

8206* Telecentric Pictures With Optical Measuring Instruments. (German.) Otto Malfeld. *Archiv für technisches Messen*, 1953, no. 214, Nov., p. 255-258.

Purpose, construction, and mode of action of telecentric optics. Picture scale; perspective and optical picture; main path of rays; telecentric systems; illumination; and possibilities of application. Diagrams.

8207* The Direct Photographic Recorder (Light-Dot-Line Recorder) as a Multiplex Recorder. (German.) H. Stabe. *Archiv für technisches Messen*, 1953, no. 215, Dec., p. 281-284.

Principle and design. Diagram, tables. 23 ref.

8208* The Pair of Strips for the Mechanical Amplification of Small Displacements. (German.) Wilhelm Vogel. *Archiv für technisches Messen*, 1953, no. 215, Dec., p. 289-290.

Simple, rugged, sensitive, and fairly accurate gage. Photograph, diagrams, graph. 4 ref.

8209* Status of Thermocouple Technology. (German.) Hans Wechsung. *Archiv für technisches Messen*, 1954, no. 216, Jan., p. 19-23.

Briefly describes several thermocouples. Photographs, graph. 3 ref.

8210* A Network Fed D.C. Amplifier Indicator With Linear Characteristics. (German.) Wilfried Oesterlin. *Archiv für technisches Messen*, 1954, no. 217, Feb., p. 41-44.

Instrument for measuring pressure and results. Graphs, diagrams, photographs. 19 ref.

8211* Improved Scale System for Stiffness Testing Machine. Harry LaTour and R. S. Sutton. *ASTM Bulletin*, 1954, no. 196, p. 40-42.

Load and angle may be made more accurately and with less operator fatigue by mounting a rotatable inverse angle scale directly below the fixed load scale. Diagrams, photographs.

8212* A Tension Impact Test for Sheet Metals. Carl W. Muhlenbruch. *ASTM Bulletin*, 1954, no. 196, p. 43-49; disc., 49-50.

Method of machining fittings and specimens as well as permissable tolerances for satisfactory test results. Diagrams, photographs, graphs, tables. 2 ref.

8213* Machine to Apply Repeated Loads to Large Flexural Members. A. Roesli, A. C. Loewer, and W. J. Eney. *ASTM Bulletin*, 1954, no. 196, p. 50-53.

Testing machine that simulates passage of trucks over bridge members. Photographs, diagrams, graph.

8214* Glass Spectrograph of High Light Power With a Flat Diffraction Grid and Certain Applications of It in Combination Spectroscopy. (Russian.) Ia. S. Bobovich and M. M. Pakhomova. *Doklady Akademii Nauk SSSR*, v. 92, no. 5, Oct. 11, 1953, p. 947-950.

Principle and advantages. Table, graphs. 5 ref.

8215 Electrical Measurements at Centimeter Wavelengths. J. W. Sutherland. *Electronic Engineering*, v. 26, Feb. 1954, p. 46-51.

Methods of measuring impedance, attenuation, and power in wave guide systems and instruments used for these determinations. Photographs, micrographs, graphs, diagrams. 2 ref.

8216* Measurement of Temperature by Thermocouple & Galvanometer. L. G. A. Sims. *Engineering*, v. 177, Feb. 5, 1954, p. 180-181.

Determining error due to overdamping. Graphs.

8217* Methods for the Determination of the Accuracy of Gas Metering. A. E. Mason. *Gas Times*, v. 78, Feb. 5, 1954, p. 153-154, 156, 161, 162-163.

Includes diagram, table.

8218 Standards of Temperature. II. R. E. Wilson. *Industrial Heating*, v. 21, Feb. 1954, p. 252 + 7 pages.

Calibration and certification of standard instruments used in maintenance of an expanded temperature scale. Photographs, diagram.

8219 A Precision Electrodynamometer Standard and A.C./D.C. Transfer Instrument. J. W. Whittaker. *Institution of Electrical Engineers, Proceedings*, v. 101, pt. 2, no. 79, Feb. 1954, p. 11-20.

Design, construction, and development of a precision wattmeter-voltmeter-ammeter-milliohmmeter. Graphs, tables, diagrams. 10 ref.

8220 The Instrument Industry—Today and Tomorrow. Richard Rimbach. *Instrumnets and Automation*, v. 27, Jan. 1954, p. 114-118.

Extent of industry, dollar volume, and present and future outlook. Graphs, tables.

8221 Maintenance and Servicing of Electronic Instruments. Jay Dobrin. *Instruments and Automation*, v. 27, Jan. 1954, p. 122-123.

First step in assuring accuracy of test instruments is establishment of preventive maintenance program. Program for a department with 1100 instruments. Photograph. 5 ref.

8222 The Thermocouple Circuit Restorer. Alex Sherman. *Instruments and Automation*, v. 27, Jan. 1954, p. 124-125.

Circuit faults in thermocouple pyrometry often are ignored because of difficulty of checking low-resistance circuits. A new instrument automatically checks complete circuit and "restores" defective contact points and poor connections. Photograph, graphs, diagram. 4 ref.

8223 Nuclear Reactors for Industry and Research. Instruments for Experiments. Clinton G. Goss. *Instruments and Automation*, v. 27, Feb. 1954, p. 284-286.

The A-1 Linear Amplifier, scalers, counting rate meters, and scintillation spectrometers, basic instruments used widely in experimental work, are discussed. Photographs.

8224 Use and Maintenance of the A-C VTVM. Jay Dobrin. *Instruments and Automation*, v. 27, Feb. 1954, p. 288-290, 300-301.

Details for servicing each component of the vacuum-tube voltmeter.

8225 A Stroboscopic Frequency Meter. C. W. McLeish and D. H. Rumble. *I.R.E., Proceedings*, v. 42, Mar. 1954, p. 594-596.

Simple frequency meter which, if properly coupled to signal source, can produce a direct reading of frequency to nearest kc. in range of 3 to 30 mc. Diagrams, photograph.

8226 Design and Calibration of Stagnation Temperature Probes for Use at High Supersonic Speeds and Elevated Temperatures. Eva M. Winkler. *Journal of Applied Physics*, v. 25, Feb. 1954, p. 231-232.

Stagnation temperature probe, with a single Pt-coated silica shield, was built for use at high supersonic speeds and elevated temperatures. Graphs, diagram. 6 ref.

8227 A Coaxial Cylinder Viscometer for the Study of Fluids Under High Velocity Gradients. Edward W. Merrill. *Journal of Colloid Science*, v. 9, Feb. 1954, p. 7-19.

Instrument for absolute measurement of shearing stress vs. velocity gradient up to high values of gradient. Diagram, table, graphs. 7 ref.

8228* Investigations of the Best Conditions for Application of the Fabry-Perot Photoelectric Spectrometer. (French.) R. Chabbal. *Journal des recherches du centre national de la recherche scientifique*, 1953, no. 24, Sept., p. 138-185.

Determination of conditions for maximum luminosity. Tables, graphs. 7 ref.

8229 Apparatus for the Determination of Minor Components of a Gas Mixture. Martin Shepherd. *Journal of*

Instrumentation and Laboratory Apparatus

Research, National Bureau of Standards, v. 52, Jan. 1954, p. 1-6.

Apparatus is primarily for determination of components occurring in low partial pressures, which ordinarly cannot be determined with satisfactory accuracy because of significant sorption and desorption of major components in reagents intended for removal of minor ones. Diagrams. 10 ref.

8230 An Accurate Voltage Integrator for Magnetic Field Measurement. E. W. Fuller and L. U. Hibbard. *Journal of Scientific Instruments,* v. 31, Feb. 1954, p. 36-42.

Integrator which accepts positive voltages in range from 0.7 to 7 v., provides a photographic record of integrated output at intervals of 0.01 sec. with an accuracy of 0.1%. Diagrams, graph. 7 ref.

8231 Highly-Developed Equipment for Inspecting Close-Tolerance Parts. C. H. Wick. *Machinery (London),* v. 84, Feb. 19, 1954, p. 397-401.

Multiple-dimension inspection and classifying machines of advanced design can be installed in production lines, to enable high-quality and close limits to be maintained in conjunction with rapid methods of manufacture. Photographs.

8232 The Mooney Viscometer. *National Bureau of Standards, Technical News Bulletin,* v. 38, Feb. 1954, p. 20-22.

Utility and limitations of instrument for quality control in synethetic rubber production and in rubber processing. Diagram, photograph. 6 ref.

8233 A Cathode Ray Oscillograph Tester for Focal Plane Shutters. Henry Wallman. *Photographic Science and Technique,* ser. 2, v. 1, no. 1, Feb. 1954, p. 3-9.

Simple and versatile apparatus. Photographs, diagrams, oscillographs. 9 ref.

8234* Microwaves for Pipeliners. X. Supervisory Control and Telemetering (Conclusion). C. B. Lester. *Pipe Line News,* v. 26, Feb. 1954, p. 41-42, 44-45, 47-48.

Concerns radio control of remote pumping stations. New designs now in use and problems encountered in supervisory control and telemetering installations functioning over microwave circuits. Diagrams.

8235* The Sun as a Reference Standard for Measuring Temperature Sources on Earth. (Russian.) E. A. Makarova. *Priroda,* v. 43, no. 2, Feb. 1954, p. 81-82.

Comparison with the sun is simpler than with an arc. A F-H flame with a Li additive was used. 1 ref.

8236 Measurement of Pressure Transients. Robert T. Eckenrode and Howard A. Kirshner. *Review of Scientific Instruments,* v. 25, Jan. 1954, p. 33-40.

General review of fluid pressure transient measurement and instrumentation. Tables, graph. 112 ref.

8237 Adsorption Studies on Clay Minerals. III. A Torsion Pendulum Adsorption Balance. Edmund W. Gelewitz and Henry C. Thomas. *Review of Scientific Instruments,* v. 25, Jan. 1954, p. 55-57.

Construction, operation, and inherent errors of a quartz fiber torsion pendulum balance. Diagrams. 4 ref.

8238 A Specimen Heater for Electron Diffraction. R. G. Picard and E. G. Dornfeld. *Review of Scientific Instruments,* v. 25, Feb. 1954, p. 158-160.

Electric specimen heater for diffraction studies at temperatures up to 1500 F. Graph, diagrams. 6 ref.

8239 Measurement of High Vacuums at Low Temperatures. M. P. Garfunkel and Aaron Wexler. *Review of Scientific Instruments,* v. 25, Feb. 1954, p. 170-172.

General usefulness of He mass spectrometer leak detector for measuring very low pressures at liquid He temperatures. Graph, diagram. 4 ref.

8240 Image-Converter Camera for Studies of Explosive Phenomena. F. C. Gibson, M. L. Bowser, C. W. Ramaley, and F. H. Scott. *Review of Scientific Instruments,* v. 25, Feb. 1954, p. 173-176.

Single-frame camera using a pulsed image-converter tube as a shutter to give 10^{-7}-sec. exposures. Photographs, diagrams. 5 ref.

8241 A Wide-Range Thremistor Radiometer for the Measurement of Skin Temperature and Environmental Radiant Temperature. Alice M. Stoll. *Review of Scientific Instruments,* v. 25, Feb. 1954, p. 184-187.

Thermistor radiometer consists of a Wheatstone bridge formed of four thermistors, two of which are exposed to incident radiation and two which act as thermal compensators. Graph, diagrams. 7 ref.

8242* Three Years Experience With Micro-Abrasion Tester. (German.) P. Grodzinski. *Schweizer Archiv für angewandte Wissenschaft und Tecknik,* v. 20, no. 1, Jan. 1954, p. 9-18.

Compares results with other methods. Photographs, graphs, diagrams, table, micrographs. 17 ref.

8243 The Role of the Instrument Engineer in Industry and Production. C. M. Gilmour. *Sheet Metal Industries,* v. 31, no. 322, Feb. 1954, p. 99-102, 114.

Operation and maintenance of modern control instruments. Photographs, diagram. (To be continued.)

8244 Pulse-Excitation of Resistance Strain Gauges for Dynamic Multi-Channel Observation. J. G. Yates, D. H. Lucas, and D. L. Johnston. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 35-44.

Pulses of a few microseconds duration have been used successfully in a new technique for exciting resistance strain gage bridges. Method is specially applicable to compact multi-channel equipments with cathode-ray tube display. Diagrams, photographs. 2 ref.

8245 The Design of Diaphragms for Pressure Gages Which Use the Bonded Wire Resistance Strain Gage. F. D. Werner. *Society for Experimental Stress Analysis, Proceedings,* v. 11, 1953, p. 137-146.

Examines problem of compromising among high sensitivity, high natural frequency, small size, adequate strength, wide pressure range, linear response, etc. Graphs, table, diagram. 6 ref.

8246* New Instruments for the Optical Recording of Mechanical Vibrations. (German.) H. Freise. *VDI Zeitschrift des Vereines deutscher Ingenieure,* v. 96, no. 1, Jan. 1, 1954, p. 22-26.

New high- and low-amplitude vibration recorders. Diagrams, graphs, photographs. 8 ref.

8247* A Geiger-Counter Goniometer According to Seemann-Bohlin Principle. (German.) Günter Wassermann and Johanna Wiewiorowsky. *Zeitschrift für Metallkunde,* v. 44, no. 12, Dec. 1953, p. 567-570.

Instrument used with and without monochromatic radiation for determining texture. Diagrams, photograph. 10 ref.

Books and Miscellaneous Publications

8248 Temperature Measurement in Engineering. H. Dean Baker, E. A. Ryder, and N. H. Baker. v. I. 179 p. 1953. John Wiley & Sons, Inc., New York. (QC271 B17t)

Chapters cover temperature; methods for measuring temperature; precision requirements; conditions affecting temperature measurement; the thermocouple thermometer—circuits; indicating instruments; design calculation and drilling techniques; installation design types; special materials; protective coatings, heat- and corrosion-resistant metals, plastics, refractories, and cements; and cemented and temperature gradient installation designs.

See also:

7474 (design of colorimeter)
7586 (pressure measurement)
7751 (aerosol electrification measurement)
7759 (specific heat measurements)
7863 (voltage measuring devices)
7937 (instrument measures resistor noise)
7955 (resistivity measurements)

7972 (design of reflex klystron)
7975 (transductors in instrumentation)
8048 (pitot tubes)
8310 (statical analog for natural vibrations)
8655 (borehole temperature measuring equipment)
8704 (photovoltaic scintillation detector)
8766 (measuring of sound waves in H_2O)
8801 (spectroscopy in one millimeter range)
8903 (rubber testing machines)
8925 (test cell for dielectric cell)
8926 (dynamic modulus tester)
9034 (equipment for determining air permeability)

LUBRICATION AND FRICTION

8249 "Hi-Jet Lubrication". B. R. Walsh. *American Society of Tool Engineers, Technical Papers and Panel Discussion*, v. 21, 1953, 7 p.

Results of laboratory tests. Table, graphs, drawings.

8250 The Dynamics and Lubrication of a Miniature Turbine Rotor on Porous Bushings. George Sines. *ASME Transactions*, v. 76, Feb. 1954, p. 319-326; disc., p. 326.

Miniature air turbine to investigate lubrication and dynamic action of the rotor shaft within the bearing clearance. Optical apparatus was used to observe time-position history of the shaft. Several different mechanisms of lubrication were identified at various speeds. Photographs, diagrams, tables. 12 ref.

8251 On the Solution of the Reynolds Equation for Slider-Bearing Lubrication. VII. The Nonsteady-State Operation of Tilting-Pad Slider Bearings. F. Osterle, A. Charnes, and E. Saibel. *ASME, Transactions*, v. 76, Feb. 1954, p. 327-329; disc., p. 330.

Contributes to understanding of non-steady-state operation of bearings by presenting a solution to a specific non-steady-state problem, namely, performance of tilting-pad slider bearing subject to a sinusoidal pivot vibration in direction normal to bearing surface. Graphs, diagram. 6 ref.

8252* Foam Formation and Defoaming Lubricating Oils. (German.) K. Hoffmann. *Erdöl und Kohle*, v. 6, no. 12, Dec. 1953, p. 791-793.

Undesirability of foaming and experiments with various defoaming agents. Tables, graph, diagrams.

8253* Present Problems in Lubricating Oils. (Japanese.) Akira Wakana. *Fuel Society of Japan, Journal*, v. 32, no. 319, Nov. 1953, p. 599-609.

Includes tables, graph, diagram. 45 ref.

8254 Azelaic Acid Derivatives in the Field of Lubrication. R. W. Moncrieff. *Industrial Chemist and Chemical Manufacturer*, v. 30, Feb. 1954, p. 51-56.

Preparation of azelaic acid and useful properties of its compounds for lubricating purposes. Tables. 16 ref.

8255* Some Factors in the Design and Lubrication of Journal Bearings. A. S. T. Thomson, A. W. Scott, W. Ferguson, and H. L. McBroom. *Institution of Engineers & Shipbuilders in Scotland, Transactions*, v. 97, pt. 4, 1953-1954, p. 257-305; disc., p. 305-312.

Oil grooving, bearing material, and surface roughness on performance of bearings and effect of use of lubricating oils in marine engines. Diagrams, graphs, photographs, tables. 27 ref.

8256 The Structure of Aluminum Stearate Grease. D. Evans and J. B. Matthews. *Journal of Colloid Science*, v. 9, Feb. 1954, p. 60-69.

Aluminum stearate grease is essentially a metastable jelly at temperatures below transformation temperature, but transforms slowly to a paste on aging. Rate of transformation is accelerated by shear. Graphs, table, micrographs. 11 ref.

8257* Filters and Purifiers for Oil Circulating Systems. *Lubrication*, v. 40, Mar. 1954, p. 29-44.

Most dependable and economic lubrication results through selection of effective lubricants and use of proper auxiliary equipment to maintain it in clean condition. Photographs, diagrams, tables, graph.

8258* Textile Mill Lubrication. K. P. Powers. *Lubrication Engineering*, v. 10, Feb. 1954, p. 11-15.

Selection of lubricants for textile machinery reviewed in terms of typical lubricants and their physical properties. Tables, photographs, drawings.

8259* Some Lubrication Problems With Roller Bearings and Their Solution. R. H. DuBois. *Lubrication Engineering*, v. 10, Feb. 1954, p. 16-19.

Includes diagrams, photographs.

8260* The Testing of Used Oil. C. L. Pope and D. A. Hall. *Lubrication Engineering*, v. 10, Feb. 1954, p. 24-28.

Tests which have been found useful for evaluating used lubricants. Examples illustrate advantages and limitations. Graphs, table. 6 ref.

8261* Air Bearing Studies at Normal & Elevated Temperatures. J. D. Pigott and E. F. Macks. *Lubrication Engineering*, v. 10, Feb. 1954, p. 29-33.

Experimental studies with a six-inch outside diameter, externally-pressurized, parallel surface, non-rotating, air thrust-bearing at temperatures to 1000 F. Drawing, graphs. 21 ref.

8262 Correcting Three Common Causes of Bearing Failure. *Metal-Working*, v. 10, Mar. 1954, p. 20-21.

Causes and cures of overheating, noise, and lubricant leakage.

8263 Solid Film Lubrication. Ernest Rabinowicz. *Product Engineering*, v. 25, Mar. 1954, p. 188-192.

When design conditions make full-fluid lubrication impractical, a boundary lubricant, liquid or solid, must be used. Graph, table, diagrams, photographs.

8264 Synthetics Help Meet Stiff Lube Needs of Turboengines. R. I. Cross. *SAE Journal*, v. 62, Mar. 1954, p. 32-38; disc., p. 38.

High-temperature stability, low viscosity at −65F, high load-carrying capacity, and rust preventive properties. Photographs, tables, diagrams, graphs.

8265* Sand as a Lubricant. Maxwell Smith. *Shell Aviation News*, 1953, no. 186, Dec., p. 14-15.

Curious phenomena and points of topical interest associated with its use in aircraft oils, greases, and special petroleum products. Photomicrographs, graph.

8266* To Mix or Not to Mix. A Study of Wheel Bearing Grease Compatibilities. Melville Ehrlich and Francis S. Sayles. *Spokesman*, v. 17, Feb. 1954, p. 8-11, 13, 15-17.

Results of studies of Na, Li, Ba, bentone, SiO_2, and Ca greases. Photographs, tables. 6 ref.

8267* A Modified Gear-Wear Tester. Robert Steinbruch and L. C. Brunstrum. *Spokesman*, v. 17, Feb. 1954, p. 18-20, 23.

Tests lubricating greases using gears of specified compositions. Graph, photographs, tables, diagrams. 3 ref.

8268* Design of Journal Bearings With Liquid Friction. (German.) A. Steller. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 96, no. 4, Feb. 1, 1954, p. 89-97.

Diagrams of experimental results. Considers radial and thrust bearings. Diagrams, graphs, tables. 12 ref.

See also:
7784 (lubricant film applied like enamel)
8171 (engine tests of motor oil)
8561 (lubricants for metal working)
8577 (lubricants for cold working—book)
8651 (self-lubricating iron bearings)
8999 (bonding of babbit bearings)

MECHANICAL ENGINEERING

8269* Flexure Analysis of Transfer Surfaces and Its Application in Hall Construction. (German.) K. Hruban. *Acta Technica Academiae Scientiarum Hungaricae*, v. 7, nos. 3-4, 1953, p. 425-464.

Effects of loads on bearing surfaces in large-span roof construction. Formulas for stress and strain components. Photographs, diagrams, table. 5 ref.

Mechanical Engineering

8270* Concerning Combined and Degenerate Vibrations of Plates. (English.) Mary D. Waller. *Acustica*, v. 3, no. 6, 1953, p. 370-374.

Distinction between "combined single" and "combined normal" vibrations of elastic plates. Two uses which are made of latter term are described. Diagrams. 21 ref.

8271 Analysis of Thin Square Plates Under Normal Pressure and Provided With Edge Frames of Finite Stiffnesses in the Plane of the Plates. (English.) Sigge Eggwertz and Artur Norr. *Aeronautical Research Institute of Sweden, Report no.* 50, 1953, 34 p. (TL526 A82r)

Formulas derived for deflections and membrane stresses, including influence of stiffness of edge frame. Graphs, photographs, table, diagram. 21 ref.

8272 Field Performance and Maintenance of Deep-Well Turbine Pumps. Charles A. Lamb. *Agricultural Engineering*, v. 35, Jan. 1954, p. 34-39.

Effects of prolonged field operation. Photographs, diagram, graphs. 5 ref.

8273 Get Your Special Machines Off to a Good Start. C. A. Nichols. *American Machinist*, v. 98, Feb. 15, 1954, p. 121-126.

With the "heat on" to cut costs, it is helpful to know the experience and philosophy of an organization that has built 1100 special machines for its own use. Photographs.

8274* Mechanical Pumps for High-Temperature Liquid Metal. *American Society of Naval Engineers, Journal*, v. 66, Feb. 1954, p. 246-252.

Pump capable of circulating approximately 400 gal. per min. of liquid metal at temperatures up to 750 F with no leakage of liquid metal at the shaft. Drawings, photographs, graphs.

8275 Automation of Machine Tool. Julius Y. Kaplan. *American Society of Tool Engineers, Technical Papers and Panel Discussion*, v. 21, 1953, 22 p.

Machines are capable of operating faster and more accurate than humans; and producing products tirelessly and with greater uniformity. Drawings, photographs, tables. 5 ref.

8276 Engineering Procedure in Product Designing. Robert L. McWilliams. *American Society of Tool Engineers, Technical Papers and Panel Discussion*, v. 21, 1953, 7 p.

Considerations which are used generally throughout General Motors to control progress from design into production of a product. Drawings.

8277 Principles of Automatic Sorting and Feeding. J. R. Paquin. *American Society of Tool Engineers, Technical Papers and Panel Discussion*, v. 21, 1953, 8 p.

Hopper feeds which automatically select and deliver parts to machines for further processing interest leaders in the metal working and allied fields. Drawings, photographs.

8278 Automatic Control and the Machine Tool. Otto C. Turchan. *American Society of Tool Engineers, Technical Papers and Panel Discussion*, v. 21, 1953, 10 p.

Theories on automation and control systems. Diagrams, drawings, photograph.

8279* New Developments in Differential-Type Hydraulic Transmissions and Controls. R. H. Eisengrein. *Application and Industry*, 1954, no. 10, p. 423-429.

Design and performance details are cited to substantiate steady-state frequency control to within 0.25% of 400 cycles per sec. Oscillographs, diagrams. 4 ref.

8280 Proposal for a Standard Design for General Industrial Coarse-Pitch Cylindrical Worm Gearing. F. G. East. *ASME, Transactions*, v. 76, Feb. 1954, p. 163-168; disc., p. 168-172.

Suggested method does not insist on a single worm diameter for each pitch or center distance but rather a limited group of worms that will cover the range of good design. Diagrams, tables, graphs.

8281 Cybernetics and Product Design. Edward A. Mahoney and Kendrick Porter. *Consulting Engineer*, v. 3, Feb. 1954, p. 36-40.

Technique deals with problem of planning complex of interdependent activities in optimum manner. Tables. 7 ref.

8282* Development of Electrical Equipment for Machine Tools. (Hungarian.) György Morvay. *Elektrotechnika*, v. 47, no. 2, Feb. 1, 1954, p. 35-49.

Starting control, changing speed, stopping the motion; possibilities and limits for use of motors with stepless speed control. Diagrams, graphs.

8283* Stresses in a Crane Jib. *Engineer*, v. 197, Feb. 5, 1954, p. 196-200 + 4 plates.

Tests on a 10-ton electric derrick crane under working conditions. Tables.

8284* Some Model Experiments on Special Control Valves. D. Firth and Leslie Young. *Engineer*, v. 197, Feb. 5, 1954, p. 207-209.

Experiments undertaken to resolve problems occurring in the valve design. Diagrams, graphs. (To be continued.)

8285* Research on Reciprocating Machines. Investigation of Vibrations in Pressure Lines of Piston Compressors. (German.) Klaus Groth. *Forschung auf dem Gebiete des Ingenieurwesens*, v. 19, Ausgabe B, *VDI-Forschungsheft* 440, 1953, p. 5-22.

Known and newly developed methods were examined and found to be in good agreement with test results. Methods for prevention of resonance. Diagrams, graphs, tables. 19 ref.

8286 Some Formulas for Large Deflections of Beam Columns. B. Saelman. *Franklin Institute, Journal*, v. 257, Feb. 1954, p. 125-132.

Cantilever beam column, simply supported centrally loaded beam column, and cantilever loaded by its own weight or by an ice load. Diagrams. 9 ref.

8287* Automatic Control System of Gas Producer. (Japanese.) Sadahiko Araki and Gen Miyazawa. *Fuel Society of Japan, Journal*, v. 32, no. 320, Dec. 1953, p. 662-669.

Tokyo Gas Co. has built eight gas-producer furnaces with automatic control system for obtaining gas of constant properties. Control system consists mainly of automatic coke-charging unit and temperature regulation by blowing in air. Graphs, diagrams.

8288* A Survey of Balancing Machine Developments in the Research Laboratories Division. Thomas C. Van Degrift. *General Motors Engineering Journal*, v. 1, Jan.-Feb. 1954, p. 7-13.

Unbalance in rotating parts is caused by many factors not under control of the designer. Special balancing machines and equipment are discussed. Photographs, diagrams.

8289 Capillary Tube Improves Heat Pump Design. G. L. Biehn. *Heating and Ventilating*, v. 51, Feb. 1954, p. 75-78.

Capillary tube simplifies heat pump design and improves operation. Advancements in use and some limitations. Photographs, diagrams.

8290* The Application of Conveyors to the Handling of Materials in Bulk. J. Findlay. *Institution of Engineers & Shipbuilders in Scotland, Transactions*, v. 97, pt. 3, 1953-1954, p. 153-199; disc., p. 199-200.

Belt, chain, and screw conveyors, bucket elevators and skip hoists. Tables, photographs, diagrams, graphs. 4 ref.

8291 General Instability of Simply Supported Rectangular Plates. J. R. M. Radok. *Journal of the Aeronautical Sciences*, v. 21, Feb. 1954, p. 109-116.

Mathematical discussion. Diagrams. 10 ref.

8292* A Theory of Torsion Bending for Multicell Beams. S. U. Benscoter. *Journal of Applied Mechanics*, v. 21, Mar. 1954, p. 25-34.

Differential equations and boundary conditions, relating warping displacements and rotations to applied torsional load, are developed for non-uniform beams with thin-walled multi-cell cross sections. Diagrams. 14 ref.

8293* Dynamic Behavior of Reinforced Cylindrical Shells in a Vacuum and in a Fluid. Miguel C. Junger. *Journal of Applied Mechanics*, v. 21, Mar. 1954, p. 35-41.

Vibrations of an infinite cylindrical shell reinforced with periodically spaced septa and stiffening rings are studied. Lagrange equations are used to derive dynamic equations; fluid reaction is obtained from solution of wave equation. Graphs, diagrams. 14 ref.

8294* Bending of Circular and Ring-Shaped Plates on an Elastic Foundation. Herbert Reismann. *Journal of Applied Mechanics*, v. 21, Mar. 1954, p. 45-51.

Method evaluates deflections moments, shears, and stresses of a circular or ring-shaped plate on an elastic foundation under transverse loads. Graphs, diagrams. 12 ref.

8295 The Theory of High-Speed Oil Diffusion Pumps. L. Riddiford and R. F. Coe. *Journal of Scientific Instruments*, v. 31, Feb. 1954, p. 33-36.

Importance of vapor density in jets of high-speed oil diffusion pumps is stressed. Graphs, diagram. 13 ref.

8296* Spring Design. XXII. W. R. Berry. *Mechanical World and Engineering Record*, v. 134, Feb. 1954, p. 77-89.

Small springs made of bent wire and shaped flat material. Diagrams, photographs, graphs, tables, nomograms.

8297* Polyethylene for Citrus. Howard W. Hruschka and J. Kaufman. *Modern Packaging*, v. 27, Feb. 1954, p. 135-128, 184.

Machine described. Performance depends on quality of fruit, rapid movement, and ventilation. Tables, photographs. 3 ref.

8298 Gas Jet Compressors. George R. Fletcher. *Petroleum Refiner*, v. 33, Feb. 1954, p. 107-111.

Advantages of low cost, no moving parts, and simple maintenance. Photographs, diagram, graphs.

8299* Selecting Superpressure Feed Pumps. III. Igor J. Karassik. *Power*, v. 98, Mar. 1954, p. 78-80.

An analysis of essential factors in picking feed cycle and components. Tables, diagrams.

8300 What the Power Engineer Needs to Know About Centrifugal Boiler Feed Pump Bearing Maintenance. Igor J. Karassik. *Power Engineering*, v. 58, Feb. 1954, p. 90-91, 111, 113.

Installation damage; contaminants in the lubricants; under- and over-lubrication; and incorrect cooling. Diagrams.

8301 Vibration Damping Characteristics of Glass Fiber Cushioning. Sol Musikant. *Product Engineering*, v. 25, Feb. 1954, p. 166-169.

Internal friction between fibers gives excellent damping properties. Graphs, oscillograms.

8302 'Three-Phase' Kinetic Energy. II. R. Clerk. *Research*, v. 7, Feb. 1954, p. 68-71 + 1 plate.

Comprehensive technical description of 'three-phase' kinetic energy as illustrated by an early design study of a *Gyreacta* transmission for a passenger vehicle. Diagrams, graphs.

8303* Apparatus for Measuring and Recording the Advancing Speed of Drilling Bits. (French.) Robert Monicard. *Revue de l'institut francais du petrole et Annales des combustibles liquids*, v. 8, no. 11, Nov. 1953, p. 527-544 + 9 plates.

Tests determine efficiency in oil well drilling operations. Graphs, diagrams, photographs.

8304* The Centre of Shear for Sections Bounded by Two Circular Arcs. L. G. Whitehead and L. A. McQuillin. *Royal Aeronautical Society, Journal*, v. 58, Feb. 1954, p. 138-139.

States results for location of the center of shear for a limited range of cross sections bounded by two circular arcs for which torsion function is known. Diagrams, table. 4 ref.

8305* Development of the Dowty Fuel Pump. F. H. Carey. *Shell Aviation News*, 1953, no. 186, Dec., p. 16-21.

Phases of development from design to operational use. Photographs, diagrams.

8306 *Society for Experimental Stress Analysis, Proceedings*, (Annual Volume), v. 11, 1953. 248 p. Society for Experimental Stress Analysis, Cambridge.

Consists of 23 papers, separately abstracted.

8307 Application of Strain Gauges to Vibration Surveys. F. J. Friel. *Society for Experimental Stress Analysis, Proceedings*, v. 11, 1953, p. 1-6.

It is shown in the case of the simple ring that strain gauges are capable of producing usable data for vibration surveys. Extension of the application to more complex structures is obvious. Tables, graphs, diagrams.

8308 Stress Concentrations for Structural Angles in Torsion by the Conducting Sheet Analogy. N. S. Waner and W. W. Soroka. *Society for Experimental Stress Analysis, Proceedings*, v. 11, 1953, p. 19-26.

A conducting paper used to solve problem of torsion of a structural angle in order to resolve wide differences existing in published data obtained in soap film tests. Graphs, photographs, diagram. 10 ref.

8309 The Effect of Load and Initial Shape on Location of Inflection Points of Fixed-Ended Columns. B. F. Goldhammer. *Society for Experimental Stress Analysis, Proceedings*, v. 11, 1953, p. 129-136.

Theoretical investigation on influence of load, original shape, and amount of original eccentricity on location of inflection points of a compression member with fixed ends. Graphs, diagrams, table. 2 ref.

8310 A Statical Analogue for Natural Vibrations. P. N. Gustafson. *Society for Experimental Stress Analysis, Proceedings*, v. 11, 1953, p. 147-158.

Apparatus will determine natural modes of vibration of elastic systems such as beams, shafts, frames, trusses, and plates. It is used in conjunction with an elastic model of the actual system. Diagrams, photographs. 2 ref.

8311 The Determination of the Critical Load of a Column or Stiffened Panel in Compression by the Vibration Method. E. E. Johnson and B. F. Goldhammer. *Society for Experimental Stress Analysis, Proceedings*, v. 11, 1953, p. 221-232; disc., p. 233-234.

Vibration technique, in conjunction with a hydraulic testing machine can be used to predict Euler buckling load of an elastic compression member with good accuracy. Vibration method of determining effective length of a column is faster and more economical than other methods and gives at least as good accuracy. Graphs, tables, photograph, diagram. 4 ref.

8312* Balancing Moving Machine Parts. IV. John E. Hyler. *Western Machinery and Steel World*, v. 45, Feb. 1954, p. 85-89.

Machines can be made to correct unbalance automatically, through electronically actuated servomechanisms. Photographs.

Books and Miscellaneous Publications

8313 Stress Concentration Design Factors. R. E. Peterson. 155 p. 1953. John Wiley & Sons, Inc., New York. (TJ233 P44s)

Contains charts and relations useful in making strength calculations for machine parts and structural elements.

8314 Mechanical Vibrations. William Tyrell Thomson. 2nd Ed. 252 p. 1953. Prentice-Hall, Inc. (QA935 T38m2)

Provides fundamentals of vibration theory and a general background for advanced study. Rational analysis developed from basic fundamentals is emphasized.

8315 Automation and Other Technological Advances. Manufacturing Series no. 205. 55 p. 1953. American Management Association, N. Y. (TJ213 Am35a)

Papers on radioactive isotopes in industry materials substitution.

8316 Frequency Response Symposium. Dynamic Systems Committee of the Instruments and Regulators Division. Articles individually paged. 1953. The American Society of Mechanical Engineers, New York. (TJ213 F89)

Includes "Frequency-Response Data Presentation Standards and Design Criteria", Rufus Oldenburger; "Sine-Wave Gen-

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erators", D. W. St. Clair, L. W. Erath, and S. L. Gillespie; "A Bibliography of the Frequency-Response Method as Applied to Automatic Feedback-Control Systems", A. M. Fuchs; "Determination of Transient Response From Frequency Response", A. Leonhard; "Analysis of Regulating Systems With Particular Reference to Speed Control", R. H. MacMillan; "Application of Frequency-Analysis Techniques to Hydraulic Control Systems", A. C. Hall; "Synthesis of Optimum Feedback Systems Satisfying a Power Limitation", J. H. Westcott; "A Uniform Approach to the Optimum Adjustment of Control Loops", R. C. Oldenbourg and Hans Sartorius; "Recent Advances in Nonlinear Servo Theory", J. M. Loeb; "A Statistical Approach to Servomechanisms and Regulators", M. J. Pélegrin; "Control-System Behavior Expressed as a Deviation Ratio", J. M. L. Janssen; "Frequency-Response Analysis and Controllability of a Chemical Plant", A. R. Aikman; "Frequency-Response Method Applied to the Study of Turbine Regulation in the Swedish Power System", V. Oja; "The Use of Zeros and Poles for Frequency Response or Transient Response", W. R. Evans; "Approximate Frequency-Response Methods for Representing Saturation and Dead Band", Harold Chestnut; and "Stability Characteristics of Closed-Loop Systems With Dead Band", C. H. Thomas.

8317 Symposium on Exchange Phenomena in Soils. ASTM Special Publication no. 142. 74 p. 1952. American Society for Testing Materials, Philadelphia, Penna. (TA710 Am35se)

Includes "Ion Exchange in Relation to Some Properties of Soil-Water Systems", Ralph E. Grim; "Cation Exchange Capacity of Loess and Its Relation to Engineering Properties", Donald T. Davidson and John B. Sheeler; "Job Experience With Exchange Phenomena Involving Inorganic and Organic Ions" and "Surface Chemical Properties of Clay Minerals and Soils From Theoretical and Experimental Developments in Electroosmosis", Hans F. Winterkorn; and "Some Effects of Treating Expansive Clays With Calcium Hydroxide", Irving Goldberg and Alexander Klein.

See also:
7397 (design of hydraulic systems)
7398 (development of hydraulic components)
7399 (development of hydraulic fluids)
7400 (design of hydraulic equipment)
7400a (design of hydraulic equipment)
7570 (drier design)
7597 (boiler feedwater treatment)
7850 (servomechanism, velocity lag system)
8213 (load test for large flexural members)
8248 (temperature measurement in engineering—book)
8344 (design of springs)
8497 (impact on beams)
8500 (stresses on shells)
8501 (stresses in pressure vessels)
8850 (vacuum formed plastics)

METALLURGY

8318 Effects of Methods of Manufacture and Steel Specifications on the Service of Disks. I. F. Reed and W. F. McCreery. *Agricultural Engineering*, v. 35, Feb. 1954, p. 91-94, 97.

Study indicates that maufacturers of disks should increase carbon content of their carbon steel disks to SAE-1085 or -1090 and heat-treat to obtain hardness in range of 42 to 44 on the Rockwell C scale. Photographs, tables, graphs. 4 ref.

8319 Titanium: Progress, Problems, Prospects. Harries-Clichy Peterson. *Analysts Journal*, v. 10, Feb. 1954, p. 61-65.

Developments and future applications.

8320 Prevention of Babbitt Blisters in Thrust-Bearing Pads. R. A. Baudry, D. W. Gunther, and B. B. Winer. *ASME, Transactions*, v. 76, Feb. 1954, p. 255-260; disc., p. 260.

Investigates processes used in manufacture of thrust-bearing pads, that results in complete elimination of babbitt blistering. Photographs, diagrams, graphs. 15 ref.

8321 Design of Steam Piping and Valves for 1100 F. F. A. Ritchings and Sabin Crocker. *ASME, Transactions*, v. 76, Feb. 1954, p. 261-271; disc., p. 271-277.

Reviews existing data. Speculates as to whether low-alloy-content ferritic steels could be made to serve the purpose. Graphs, tables. 34 ref.

8322 Titanium Outlook. Englebert Kirchner. *Aviation Age*, v. 21, Feb. 1954, p. 32-37.

Survey on Ti collects opinions held by airframe, engine, and power-plant manufacturers. Photographs, charts.

8323* Titanium. II. Possible Workability and Special Properties. (Dutch.) E. C. Smits. *Bedrijf en Techniek*, v. 9, no. 196, Feb. 27, 1954, p. 105, 107, 109.

Behavior in casting, high-temperature forging, cutting, bending, deep-drawing, plating, and heat treating. Tendency of Ti to absorb O and N at high temperatures.

8324* Silver. Roberto Antoniolli. *Canadian Mining and Metallurgical Bulletin*, v. 47, no. 502, Feb. 1954, p. 94-105.

General discussion of production, consumption, availability, and applications. Tables, graphs. 55 ref.

8325* High Alloy Castings in Heat Treating Equipment. *INCO*, v. 26, no. 3, p. 12-13, 28-29.

High alloy castings resist high temperature conditions, reduce costs, and prevent breakdowns. Photographs.

8326* Chain for a Life Line. *INCO*, v. 26, no. 3, p. 16-17.

Austenitic Ni-Mn steel, used for non-magnetic anchor chains, machines at twice the cost of Ni-Cr-Mo steel. Photographs.

8327 Low-Cost Alloys Offer Good Heat Resistance. I-II. R. W. Boring. *Iron Age*, v. 173, Feb. 18,, p. 137-141; Mar. 11, 1954, p. 146-148.

Knowledge of physical, mechanical, chemical, and metallurgical properties of wrought heat-resistant alloys can aid considerably in proper selection and pay off well in savings of time and money. Photographs, tables.

8328 Vanadium. S. H. Frederick and T. F. Eden. *Iron & Steel*, v. 27, Feb. 1954, p. 67-69.

Corrosion aspects in gas turbines. Tables.

8329 The Manufacture and Use of Boron Steels in the U.S.A. Louis J. Rohl. *Iron and Steel Institute, Journal*, v. 176, Feb. 1954, p. 173-180; disc., p. 180-187.

Presented at special meeting on "Boron in Steel", Iron and Steel Inst., Apr. 1953, London. Survey of development of boron steels as a means of conserving critical alloys. Methods of manufacture using simple and complex boron ferro-alloys. Tables, graphs, diagrams, micrographs. 10 ref.

8330 Titanium Alloys Give Promise of High Temperature Applications. F. A. Crossley and H. D. Kessler. *Journal of Metals*, v. 6, Feb. 1954, p. 119-121.

Condensed from a paper presented at the AIME Institute of Metals Div. meeting, Cleveland, Oct. 21 to 23, 1953. Compares experimental and commercial alloys. Tables, graphs. 5 ref.

8331 Standards for Aluminium Casting Alloys. F. H. Smith. *Light Metals*, v. 17, Feb. 1954, p. 51-54.

Compares British and other specifications for quantities of composition elements. (To be continued.)

8332 High-Strength Low-Alloy Steels. *Materials & Methods*, v. 39, Feb. 1954, p. 117-132.

General characteristics, corrosion resistance, special service properties, joining and working characteristics, design considerations, applications, and economics. Photographs, tables, graphs. 22 ref.

8333 A Dictionary of Metallurgy. A. D. Merriman and J. S. Bowden. *Metal Treatment and Drop Forging*, v. 21, Feb. 1954, p. 83-90.

Covers "lattens" to "Lipowitz's alloys". Diagrams, tables. (To be continued.)

8334* Copper and Copper Alloys. XIII. Brass. (Dutch.) W. G. R. De Jager. *Metalen*, v. 8, no. 21, Nov. 15, p. 390-392; no. 23, Dec. 15, 1953, p. 426-427.

Summarizes composition of standard brasses of Germany, Great Britain, and the USA. Tables. (To be continued.)

8335* Chemical Polishing. (German.) H. Spähn. *Metalloberfläche*, Ausgabe B, v. 6, no. 2, Feb. 1954, p. 17-26.

Bath composition for Al and Cu alloys. Graphs, micrographs, photographs, table. 10 ref.

8336* Contribution of Industrial Metrology and High Precision Mechanics to the Elimination of Scrap. *Microtecnic (English Ed.)*, v. 7, no. 6, 1953, p. 273-366.

Consists of "The Works Manager and the Problem of Scrap", André Léauté; "The Engineer and the Problem of Scrap", P. Nicolau; "The User's Point of View", Raison and Chapon; "The Manufacturer's Point of View", R. Masse and Maugras; "The Contribution of Copying to Precision Turning", Le Lan; "Recent Progress in Centreless Grinding", W. Loewe; "Inspection, the Guardian of Quality", G. Langendorff; "Automatic Inspection as a Means and Reducing Costs of Improving Quality", Romano; "Metrology Associated With the Machine-Tool", Yribarren; "Results Obtained by Using Gauging Instruments of the Sonic Flow Type on Machine Tools", A. Fortier. Tables, photographs, graphs, diagrams.

8337* Metallurgical Aspects of High Temperature Steam and Gas Turbine Plants. J. M. Robertson. *North East Coast Institution of Engineers & Shipbuilders, Transactions*, v. 70, Feb. 1954, p. 217-252.

Composition, mechanical properties, corrosion heat treatment, and welding of steels and other alloys for use above 850 F. Graphs, tables.

8338 Stainless Steel Powder Magnetic Clutches. Alvin S. Weiss. *Product Engineering*, v. 25, Feb. 1954, p. 142-145.

Specialized application of a dry powder magnetic particle clutch. Graph, table, photograph, diagram. 9 ref.

8339* Special Aluminum Alloys Obtained by Extrusion and Their Application. II. (French.) Pierre Pétrequin and Michel Costeraste. *Revue de l'Aluminium*, v. 31, no. 206, Jan. 1954, p. 33-41.

Various types of light alloys can withstand special fabrication methods. Describes limits of length, thickness, and profile of the products. Tables, diagrams, graphs. (To be continued.)

8340 A Pinch of Boron Doubles Yield Point of Low-Carbon Steel. *Steel*, v. 134, Feb. 22, 1954, p. 107-108, 110.

Combination of 0.5% Mo and as little as an ounce of B turned out to be right for a high-tensile, readily weldable steel. Photograph, tables, graph.

8341 How to Classify Copper Base Alloys. III. *Steel*, v. 134, Feb. 15, 1954, p. 114-115, 118.

Most Cu-base compositions for castings are mixed brass and bronze. Usually in the α range, alloys often contain Pb and other minor ingredients. Photographs, table.

8342 Way to Save Nickel. *Steel*, v. 134, Feb. 15, 1954, p. 122.

New alloying technique. Photographs.

8343* The Search for New Alloys. G. L. Bailey. *Times Review of Industry (Supplement)*, 1954, p. 35-36, 39.

Non-ferrous metals are in greater demand than ever before to meet changing requirements of modern engineering and manufacturing methods. Photographs.

8344* Discussion on Precision Spring Design. I. M. Gerard Fangemann. *Wire and Wire Products*, v. 29, Feb. 1954, p. 152-157, 207-209.

Results of experimental research. Basic spring design equations for main types of springs, including extension, compression, spiral, torsion, and form springs. Table, diagrams, graph.

Books and Miscellaneous Publications

8345 Fabricated Materials and Parts. Theodore C. DuMond. 332 p. 1953. Reinhold Publishing Corp., N. Y. (TS205 D89f)

Information considered in either design or manufacture of any part. Chapters cover sand, permanent mold, paster mold, die, and investment castings; drop, press, and upset forgings; cold headed, powder metal, screw machine, electro formed, and press formed parts; extruded and spun shapes; and welded, brazed, and adhesive bonded parts.

8346* 1953 Supplement to Book of ASTM Standards, Including Tentatives. I. Ferrous Metals. 363 p. 1953. American Society for Testing Materials, Philadelphia. (TA410 Am35a)

Contains extensively revised standards and the new and extensively revised tentatives that have been accepted since the appearance of the 1952 Book of ASTM Standards.

See also:
7651 (emission spectrochemical analysis—book)
7852 (manufacture of transformer cores)
7886 (industrial electric furnace)

METALS—EXTRACTION AND REFINING

8347* Specific Weights of Box Furnace Slags by Reduction of Lead Sinters. (Portuguese.) Tharcisio D. de Souza Santos and Joao Galha. *ABM (Boletim da associacao brasileira de metais)*, v. 9, no. 32, July 1953, p. 424-436.

Determines by pycnometry, specific weight of Pb slag samples obtained by melting reduction furnace slags in electric furnace. Composition of slags studied were between 20 to 65% SiO_2, 30 to 80% FeO, and 5 to 40% CaO. Graphs, charts.

8348* Microstructures Observed in Sinters From the Monlevade (Brazil) Factory. (Portuguese.) Janusz Wscieklica. *ABM (Boletim da associacao brasileira de metais)*, v. 9, no. 32, July 1953, p. 332-343.

Semi-self-fluxing and self-fluxing sinter data and relationship between microstructure and quality of these two types of sinter. Table, micrographs. 5 ref.

8349* Electrolytic Refining of Aluminum. I. Some Physicochemical Properties of Baths and Their Influence in Electrolysis of Aluminum. II. Secondary Formation of Aluminum. Thermodynamics of Reactions at the Electrodes. III. New Explanation of Anodic Effect by Considering the "Solvation" of Ions in Igneous Electrolysis of Aluminum. Possible Existence of Perfluorides at the Anode. IV. Is There a Relationship Between the Composition of Eletrolysis Bases and the Faraday Efficiency? Origin of CO-Variation With Interpolar Distance. (French.) E. Pruvot. *Alluminio*, v. 22, no. 6, Dec. 1953, 31 p.; disc., 7 p.

Includes tables, graphs, diagrams. 4 ref.

8350* A New Method of Rapid Analysis of Baths Used in Electrolytic Production of Aluminum. (French.) M. Fiquet and M. Armand. *Alluminio*, v. 22, no. 6, Dec. 1953, p. 621-628; disc., p. 628-630.

Suggests caustic soda to separate sample into two phases. Presents data from routine tests. Graphs, diagrams, table.

8351* Classification of Baths by the Electrolysis of Al_2O_3 According to Phase Diagrams and Micrographic Analysis. (Italian.) A. Vajna. *Alluminio*, v. 22, no. 6, Dec. 1953, p. 635-641; disc., p. 641-643.

Thermal analysis of cryolite base binary and ternary systems was carried out with special equipment. Photographs, micrographs, diagrams, graphs.

8352* Considerations on the Power Balance of Electrolysis for Production of Aluminum. (French.) R. Piontelli. *Alluminio*, v. 22, no. 6, Dec. 1953, p. 731-745; disc., p. 745-748.

Relates composition of Al pot gases and current efficiency. Diagrams, tables. 11 ref.

8353 Electric Furnace vs. Open Hearth Furnace in Cold Metal Shops. L. F. Reinartz and H. C. Barnes. *American Iron and Steel Institute, Preprint*, Dec. 3, 1953, 19 p. (TS300 Am35ta)

Fuel, materials handling, steel quality, and economic considerations. Tables.

Metals—Extraction and Refining

8354 The Preparation of High-Purity Iron Ingots. C. W. P. Rengstorff and H. B. Goodwin. *American Iron and Steel Institute, Preprint,* Dec. 3, 1953, 7 p. (TS300 Am35ta)

Procedure and results of chemical analysis. Tables. 6 ref.

8355* Metallurgical Behavior of Chromium Ores. (German.) Dieter Hoenes and Georg Volkert. *Archiv für das Eisenhüttenwesen.* v. 25, nos. 1-2, Jan.-Feb. 1954, p. 1-10.

Refining behavior of ores containing small amounts of solid chromite. Tables, graphs, micrographs. 7 ref.

8356* Sampling of Ores and Slags During Iron Manufacture. (German.) Kurt Möhl. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 1-2, Jan.-Feb. 1954, p. 33-37; disc., p. 37-38.

Quantity of sample and place to secure it. Diagrams.

8357* Method of Obtaining Gallium From Commercial Aluminum Alloys. (German.) Ekkehard Gastinger. *Berg- und hüttenmännische Monatshefte der montanistischen Hochschule in Leoben,* v. 99, no. 1, Jan. 1954, p. 13-16.

Problem of separating small quantities of Ga from large quantities of Al and Fe. Tables, diagram. 14 ref.

8358 Characteristics of Slags Obtained in the Production of Ferromanganophosphorus in the Blast Furnace. A. L. Zagyanskii. *Henry Brutcher, Altadena, Calif., Translation no.* 3042, 5 p. (From *Doklady Akademii Nauk SSSR,* v. 83, no. 2, 1952, p. 265-267.)

Importance of a suitable slag in production of Fe-Mn-P in the blast furnace to insure a maximum recovery of two dissimilar elements. Tables. 3 ref.

8359 Continuous Casting of Gray Iron. A. N. Myasoedov and I. R. Dudnik. *Henry Brutcher, Altadena, Calif., Translation no.* 3096, 12 p. (From *Liteinoe Proizvodstvo,* v. 3, no. 11, 1952, p. 2-5.)

Report on quality of gray-iron bars from a plant in the Soviet Union. Diagrams, photographs, micrographs, tables.

8360 Quantitative Study of Extraction of Titanium Dioxide From Ilmenite by Smelting. II. W. Freundlich. *Henry Brutcher, Altadena, Calif., Translation no.* 3120, 19 p. (From *Bulletin de la Société Chimique de France,* v. 19, no. 5, 1952, p. 496-501.)

Slag composition, temperature, heating time, and kind of ore. Tables, graphs.

8361 Elimination of Hydrogen From Molten Steel by Flushing With Gas. R. Hamrin and F. de Kazinczy. *Henry Brutcher, Altadena, Calif., Translation no.* 3200, 24 p. (From *Jernkontorets Annaler,* v. 137, no. 7, 1953, p. 224-237.)

Non-equalibrium between H content of steel and partial pressure of H in bubbles. Theoretical treatment and comparison with experimental data. Graphs, table. 20 ref.

8362 On the Possibility of Removing Copper From Steel and Pig Iron. L. Ameen and C. Pfeiffer. *Henry Brutcher, Altadena, Calif., Translation no.* 3206, 26 p. (From *Jernkontorets Annaler,* v. 137, no. 7, 1953, p. 238-251.)

Previously abstracted from original. See item 808, v. 3, Jan. 1954.

8363 Magnetizing Roasting of Low-Grade Iron Ores. H. Hendrickx and G. Scheibe. *Henry Brutcher, Altadena, Calif., Translation no.* 3212, 14 p. (From *Archiv für das Eisenhüttenwesen,* v. 23, nos. 8-10, 1952, p. 321-324.)

Studies possibility of magnetizing roasting of α modification of ferric oxide by using solid additions. Particulars of experimental setup, starting material, and additions. Photographs, diagram, tables. 16 ref.

8364* Theory of the Electrolytic Preparation of Aluminum. (French.) E. Bonnier. *Bulletin de la société chimique de France,* 1954, no. 1, Jan., p. D1-D11.

State of dissociation of alumina-cryolite baths, determination of physical constants of baths, phase diagrams, decomposition stress of constituents, and displacement reactions are studied. Experimental study on formation of metallic Na, Al fog, variations of composition of electrolyte, composition of anodic gases, Faraday yield of normal electrolysis, and abnormal electrolysis. 85 ref.

8365 Reverberatory Furnaces for Melting Aluminum. *Canadian Metals,* v. 17, Feb. 1954, p. 18, 20.

Fast, economical method of melting Al with maintained quality.

8366 Beneficiation of Low Grade Saskatchewan Uranium Ores. I. J. O. Korchinski, G. A. Craig, S. D. Cavers, and A. B. Van Cleave. *Chemistry in Canada,* v. 6, Feb. 1954, p. 34-39.

Based on paper presented to Chemical Engineering Division, Chemical Inst. of Canada, at 36th Annual Conference, Windsor, June 1953. Equipment, materials, and methods. Map, diagram, photograph, graphs, tables. 12 ref.

8367* Application of Zone Melting Technique to Obtain High Purity Aluminum. (French.) Frédéric Montariol, Robert Reich, Philippe Albert, and Georges Chaudron. *Comptes rendus,* v. 238, no. 7, Feb. 1954, p. 815-817.

Adaptation of method used to refine Ge. Claims purity of 99.998%. Tables. 3 ref.

8368* Calculation of the Speed of Solidification of an Ingot, Taking Into Account the Temperature Dependence of the Thermophysical Parameters of the Metal. (Russian.) B. Ia. Liubov. *Doklady Akademii Nauk SSSR,* v. 92, no. 4, Oct. 1, 1954, p. 763-766.

Method permits consideration of temperature dependence on heat conductivity and content. 4 ref.

8369 Modern Plant Will Treat Mesabi Lean Ores. E. C. Herkenhoff. *Engineering and Mining Journal,* v. 155, Mar. 1954, p. 78-83.

Equipment, plant layout, and operating procedures. Diagrams, table, photographs.

8370* Automatic Open-Hearth Furnace Control Depending on Roof Temperature Measurement. (Czech.) Miloslav Gottwald. *Hutnické Listy,* v. 9, no. 2, Feb. 1954, p. 90-94.

Description and operation. Diagrams, photographs, charts.

8371* Iron Ore to Be Recovered From Nickel Ores. *INCO,* v. 26, no. 3, p. 7-8.

New process will ultimately yield 1,000,000 tons of high-grade ore per year. Photograph.

8372 Preparation of Ores. J. M. McLeod. *Iron & Steel,* v. 27, Feb. 1954, p. 49-54.

Methods of improvement of blast furnace burdens. 56 ref.

8373 Temperature Distribution in the Hearths of Blast Furnaces. V. Paschkis and Taghi Mirsepassi. *Iron and Steel Engineer,* v. 31, Feb. 1954, p. 53-59; disc., p. 59-66.

Location of 2100 F isotherm was computed in furnaces with ceramic and carbon linings. Diagrams, graphs, photograph.

8374 Some Factors Affecting the Wear of Graphite Electrodes in the Electric-Arc Furnace. *Iron and Steel Institute, Journal,* v. 176, Feb. 1954, p. 159-165 + 2 plates.

Abnormally rapid wear of graphite-electrode collars is usually associated with a high electrical resistivity, which is probably due to incomplete graphitization of material. Simple nondestructive resistivity tests for complete electrodes. Graphs, photographs, diagrams, tables. 4 ref.

8375* The Application of Hydraulic Cyclones in Low Grade Ore Milling. (Swedish.) P. H:son Fahlström. *Jernkontorets Annaler,* v. 138, no. 1, 1954, p. 1-16.

Theory and action of hydraulic cyclone as a classifier with experiments on specular hematite slime. Application on various ores. Diagrams, graphs, tables, photographs. 21 ref.

8376 Chromium Distribution Between Liquid Iron and Molten Basic Slags. Nicholas J. Grant, Earl C. Roberts, and John Chipman. *Journal of Metals,* v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions,* v. 200, Feb. 1954, p. 145-149.

Study of distribution of Cr and O between liquid Fe, containing less than 1% Cr, and simple slags in temperature range 1526 to 1734 C. Graphs, photomicrographs, table. 15 ref.

8377 Distribution of Manganese Between Slag and Metal Under Reducing Conditions. J. E. Stukel and J. Cocubinsky. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Mar. 1954, p. 353-356.

Investigates equilibrium distribution of Mn between blast-furnace type slags and Fe saturated with C. Diagram, graphs, table. 5 ref.

8378 Application of the ARL Quantometer to Production Control in a Steel Mill. H. C. Brown. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Mar. 1954, p. 349-352.

Rapid analysis for production control of all types of stainless steel used for final tests from a number of stainless, Si, and plain C steels. Tables, graphs. 2 ref.

8379 Copper Converting Practice at American Smelting and Refining Company Plants. F. W. Archibald. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Mar. 1954, p. 358-360.

Standardization of Cu converting practice to attain a maximum unit blister production with a minimum of refractory consumption by careful location of tuyeres and by applying magnetite coatings on hard-burned magnesite brick linings.

8380* Complex Utilization of Bauxite. (Hungarian.) Adám Juhász. *Kohászati Lapok*, v. 9, no. 1, Jan. 1954, p. 10-17.

Reduceability of iron oxide in bauxite, correct composition of the slags, waste gases, and behavior of secondary constituents. Tables, graphs. 7 ref.

8381* The Problem of Economical Current Density, and the Exploitation of Capacity of Aluminum Plants. (Hungarian.) Endre Balázs. *Kohászati Lapok*, v. 9, no. 1, Jan. 1954, p. 38-42.

Relates economical current density and furnace construction; calculating necessary current densities and interpretation of results. Graphs, tables. 2 ref.

8382* Present Work in the Field of the Production of Copper. (Italian.) G. Porro. *Metallurgia italiana*, v. 45, no. 11, Nov. 1953, p. 405-424.

Ore treatment, extractive metallurgy, foundry practice with black and blister Cu, refining of black Cu, and casting. Diagrams, graph. 7 ref.

8383* A New Aspect of Italian Iron and Steel Production. Heating of Open-Hearth Furnaces With Methane-Fuel Oil. (French.) G. Danielou. *Métallurgie et la construction mécanique*, v. 86, no. 1, Jan. 1954, p. 41, 43, 45.

Principles of burner transformation and results. Photographs, diagrams.

8384* Preparation of the Burden of Blast Furnaces Using Lorraine Minettes. (French.) Paul Thierry. *Métallurgie et la construction mécanique*, v. 86, no. 2, Feb. 1954, p. 87, 89, 91.

Includes graph, diagram.

8385* The Study of Conditions for a Good Distribution of Materials in the Blast Furnace. III. Charging Equipment. IV. Method of Charging. V. Radial Distribution and Balanced Charging. (French.) Jean Vibrac. *Métallurgie et la construction mécanique*, v. 86, no. 1, Jan. 1954, p. 11 + 4 pages; no. 2, Feb. 1954, p. 92, 95, 97.

Radial distribution, influence of height of materials in the stack, and various bell operations. Outlines various aspects of charging. Diagrams, graphs.

8386 Developments in Minerals Beneficiation. Donald W. Scott. *Mining Engineering*, v. 6, Feb. 1954, p. 166-183.

Reviews progress in fields of crushing and grinding; screening and classification; solids-fluids separation; flotation; solution and precipitation; agglomeration; and sintering. Photographs.

8387 Flotation Theory. Molecular Interactions Between Frothers and Collectors at Solid-Liquid-Air Interfaces. J. Leja and J. H. Schulman. *Mining Engineering*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 199, Feb. 1954, p. 221-228.

Long-chain homologs of alcohols and alkyl sulfates react strongly with xanthates at the air-liquid interface; reactions between frothers and collectors occur at the solid-liquid interface if the solid is suitably coated by collector molecules; and effects of collector-frother associations are evident in frothing and flotation tests. Diagrams, graphs, tables. 23 ref.

8388* Magnetite Pelletizing and the Production of Sponge Iron. *Mining Magazine*, v. 90, Feb. 1954, p. 75-78.

Ore-dressing at Bodäs mines and sponge iron production at Sandviken, Sweden. Photographs, diagram.

8389* Diffusion of Sulfur in Molten CaO-SiO_2-Al_2O_3 Slag. (English.) Tunezo Saito and Yasuji Kawai. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 5, Oct. 1953, p. 460-468.

Rate of diffusion of S was first determined by use of S^{35} in studying the kinetics of desulfurization of Fe by slag. Diffusion coefficient in acid slag at 1,440 C was nearly the same as in a basic slag. Diagrams, graphs, tables. 3 ref.

8390 Refining Molybdenum. *Steel*, v. 134, Mar. 1, 1954, p. 146-147.

Electrolytic preparation has proved successful.

8391* Discontinuous Freezing Processes in Continuous Casting of Raffinal or Pure Aluminum. (German.) Dietrich Altenpohl. *Zeitschrift für Metallkunde*, v. 44, no. 11, Nov. 1953, p. 536-550.

Periodic liquations were found in up to 15 mm. below casting skin of reheated ingot surface. Pure Al showed highly variable etchability. Photographs, graphs, micrographs, diagrams, tables. 10 ref.

Books and Miscellaneous Publications

8392* The Control of Quality in the Production of Wrought Non-Ferrous Metals and Alloys. I. The Control of Quality in Melting and Casting, Symposium. Institute of Metals Monograph and Report Series no. 15. 88 p. 1953. Institute of Metals, London. (TN758 In7c)

Monograph consisting of six reprints from *Institute of Metals, Journal*, v. 81, Mar. 1953, with the discussions upon them.

See also:
7520 (silica brick in open hearth furnace)
7535 (inclusions from refractories)

METALS—FINISHING, POLISHING, AND CLEANING

8393* Roughness of Cast Metallic Pieces. (Portuguese.) Carlos Dias Brosch. *ABM (Boletim da associacao brasileira de metais)*, v. 9, no. 32, July 1953, p. 344-365.

Surface-appearance factors, finishing operations, and precision of dimensions. Methods of investigating roughness. Graphs, diagrams, tables, micrograpahs. 14 ref.

8394 Tumbling or Barrel Finishing. H. Cox. *Canadian National Research Council, Technical Information Service Report no.* 33, Nov. 1953, 10 p. (T13 N21.7t)

Various finishing processes, media, compounds, equipment, and operation. 28 ref.

8395* Descaling the Stainless Steels. Lester F. Spencer. *Metal Finishing*, v. 52, Feb. 1954, p. 54-59.

Equipment and techniques employed in mechanical and acid descaling operations. Photographs, graphs, table. 6 ref.

8396* Surface Preparation by Blast Cleaning Prior to Electroplating. Victor F. Stine. *Metal Finishing*, v. 52, Feb. 1954, p. 65-71.

Equipment, techniques, advantages, and limitations. Diagrams, chart, photographs.

8397* New Development in the Regeneration of Pickling Baths. (French.) Jean Labergere. *Métallurgie et la construction mécanique*, v. 86, no. 2, Feb. 1954, p. 127-128.

Ruthner process where baths are continuously concentrated by evaporation and contact with gaseous HCl. Diagrams.

8398 A.E.S. Research Report: Project no. 12. Cleaning and Preparation of Metals for Electroplating. VIII. Effect

Metals—Finishing, Polishing, and Cleaning

of Oxide Films. A Survey of Literature. Henry B. Linford and David O. Feder. *Plating*, v. 41, Mar. 1954, p. 279-286.
Summarizes previous work. (To be continued.)

8399 Liquid Honing in Russia. *Product Finishing*, v. 7, Feb. 1954, p. 80-83.
New plant cleans castings by liquid jets with abrasive material driven by compressed air.

8400* Ultrasonic Cleaning. C. Fred Gurnham. *Products Finishing*, v. 18, Feb. 1954, p. 54, 56, 58, 60, 62, 64, 66, 68.
Technique removes minute particles of dust or dirt not affected by conventional cleaning. Photographs, diagrams.

8401* The Preparatory Treatment of Metallic Surfaces Previous to Painting and the Latest Development in Cleaning and Preservation Practice. (German.) Bernhard F. H. Scheifele. *Werkstoffe und Korrosion*, v. 5, no. 1, Jan. 1954, p. 5-10.
Importance of surface preparation for corrosion resistance and durability of organic protective coatings. 30 ref.

Books and Miscellaneous Publications

8402 Recommended Practices for the Cleaning, Inspection and Testing of Steam Generator Coils to Determine Their Condition and Eliminate Failure. Andrew J. Ritter, chairman. Paper from OFFICIAL PROCEEDINGS OF THE 1953 ANNUAL MEETING MASTER BOILER MAKERS' ASSN. p. 52-57; disc., p. 57-66. 1953. Master Boilermakers' Assn., Albert F. Stiglmeier, Secretary, Albany 8, N. Y. (TJ281 M39o)

8403 Study and Recommendation for the Washing and Cleaning of Diesel Locomotive Water Tanks. F. E. Godwin, chairman. Paper from OFFICIAL PROCEEDINGS OF THE 1953 ANNUAL MEETING MASTER BOILERMAKERS' ASSN. p. 75-82; disc., p. 83-86. 1953. Master Boilermakers' Assn., Albert F. Stiglmeier, Secretary, Albany 8, N. Y. (TJ281 M39o)

See also:
7811 (cleaning metal surfaces)

METALS—FOUNDRY PRACTICE

8404 Casting Quality as Related to pH Value of Molding Sands. Victor E. Zang and Gerald J. Grott. *American Foundryman*, v. 25, Mar. 1954, p. 49-59.
Better control of molding sand properties and marked reduction in casting defects accompanied adjustment of pH in green sand mixtures. Tables, graphs, photographs, diagram. 9 ref.

8405 Shell Molds for Titanium Castings. R. M. Lang. *American Foundryman*, v. 25, Mar. 1954, p. 60-62.
$ZrOCl_2$ wash reduces sub-surface contamination of Ti cast in shell molds of silica, zircon, and zirconia; improves surface finish of the casting; and reduces amount of pinholing; but does not decrease over-all depth. Washed zircon and zirconia molds give better surface finish to castings thicker than one inch, but subsurface contamination is as bad as with silica. Graphs, photographs. 6 ref.

8406 Strength of White Irons in the Temperature Range of Hot Tearing. J. P. Frenck and R. W. Heine. *American Foundryman*, v. 25, Mar. 1954, p. 68-72.
Tensile strength of white irons reported from 2030 to 2200 F. Slight contraction can cause complete tearing. Cause of hot tearing may be from internal characteristics or from external factors. Graphs, photomicrographs, diagrams, tables. 3 ref.

8407 Effective Methods of Inoculating Cast Iron. A. F. Durnienko. *Henry Brutcher, Altadena, Calif., Translation no.* 3162, 4 p. (From *Liteinoe Proizvodstvo*, v. 4, no. 6, 1953, p. 9, 15.)
Difficulties in inoculation of cast iron for a spheroidal graphite structure, arise from their low melting and boiling points.

8408 The Reaction of Solid Iron With Molten Aluminum Alloys Containing Zinc. K. Schneider and H. Kessler. *Henry Brutcher Altadena, Calif., Translation no.* 3168, 7 p. (From *Metall*, v. 7, nos. 15-16, 1953, p. 608-610.)
Previously abstracted. See item no. 13504, v. 2, 1953.

8409 The Croning Shell-Molding Process. A New German Development. F. Pölzguter. *Henry Brutcher, Altadena, Calif., Translation no.* 3183, 11 p. (Condensed from *Die Giesserei*, v. 39, no. 19, 1952, p. 467-472.)
Development, particulars on materials, and preparation of patterns and pattern plates. Photographs, diagrams. 2 ref.

8410* The Use of Foundry Sand Tests. Proposal for a Drawing Test. (French.) Francois Boussard. *Fonderie*, 1953, Dec., no. 95, p. 3707-3714.
Aspects of testing sands using standardized method of American Foundrymen's Assn. Disagreement was between laboratory tests and actual foundry practice. Graphs, diagrams.

8411* The Study of Feedhead. Use of Exothermic Products. (French.) Pierre Nicolas. *Fonderie*, 1953, Dec., no. 95, p. 3715-3725.
Size of feedhead, part of the piece in which it must act, and how to assure feeding. Graphs, diagrams. 8 ref.

8412* Inserts in Ligh-Alloy Castings. (French.) *Fonderie*, 1953, Dec., no. 95, p. 3726-3727.
Precautions for avoiding cracks or bubbles which occur around inserts, and insufficient anchoring of insert.

8413 Alloy Gray Iron—What Does It Cost? *Foundry*, v. 82, Mar. 1954, p. 122-123, 311-314.
Determination of cost of special alloy irons when produced by adding alloys to base metal. Photograph.

8413a Trade Names of Foundry Equipment, Supplies and Services. *Foundry*, v. 82, Mar. 1954, p. 165-204.
Directory of producers of machines, materials, and service distributed under various trade names and trade-marks.

8414 Melting Iron in the Reverberatory Furnace. Carl G. de Laval. *Foundry*, v. 82, Mar. 1954, p. 224 + 5 pages.
Discusses factors affecting highest operating efficiency.

8415* Cupola Operation With Oxygen Enriched Air. (Japanese.) Sunao Yoshioka. *Fuel Society of Japan, Journal*, v. 32, no. 319, Nov. 1953, p. 634-641.
Experiment on effect of added O in cupola blast. Graphs, tables, diagrams, photographs.

8416* Feeding and Solidification. I. Controlled Solidification. II. Feeders. (Swedish.) K. Akesson. *Gjuteriet*, v. 43, no. 12, Dec. 1953, p. 209-221; v. 44, no. 1, Jan. 1954, p. 1-10.
Principles of directed solidification, influence of form of casting, feeding system, rate of pouring, pouring temperature, and molding materials with different thermal characteristics. Tables, diagrams, graphs. 49 ref.

8417 Theoretical Analysis of Diffusion of Solutes During the Solidification of Alloys. Carl Wagner. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Feb. 1954, p. 154-160.
Theoretical calculations. Graphs, tables. 19 ref.

8418* Mechanical Properties of Metal Castings Produced by the Lost Wax Process. (Russian.) I. I. Goriunov and I. P. Bashkov. *Liteinoe Proizvodstvo*, 1954, no. 1, Jan.-Feb. p. 5-7.
Tensile tests were made on steel specimens cast in various configurations. Influence of casting procedure on heat treating properties was determined. Tables, photographs. 4 ref.

8419* Removal of Sulfur With Magnesium During Processing of Cast Iron. (Russian.) K. I. Vashchenko, P. V. Avrinskii, and B. M. Pashkovskii. *Liteinoe Proizvodstvo*, 1954, no. 1, Jan.-Feb., p. 9-14.
Desulfurization by Mg with consideration of temperature and time factors. Tables, graphs, photographs, micrographs. 4 ref.

8420* Application of Metal Grids in Chill Casting. (Russian.) I. V. Mrygin. *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb., p. 7-8.

Investigates use in casting light alloys. Diagrams.

8421* Filling a Duct in a Sand Mold. (Russian.) B. B. Guliaev, V. M. Shpeizman, and P. E. Kovalenko. *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb., p. 15-17.

Study of metal flow in a mold. Graphs, diagrams, table. 3 ref.

8422* Determining the Coefficient of Discharge of Pouring Systems for Steel Castings. (Russian.) M. A. Kremer and V. N. Dudorova. *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb., p. 17-23.

Cross section of intake duct, coefficient of resistance, and influence of duct contour. Diagrams, table. 4 ref.

8423* Melting of Non-Briquetted Cuttings in the Cupola Furnace. (Russian.) Iu S. Sukharchuk and M. P. Nikolaichik. *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb., p. 30-31.

Melts made of steel, cast iron, and mixed cuttings. Graphs.

8424 Founding Magnesium-Base Alloys. V. Various Defects. VI. Recurring Defects. VII. Input. VIII. Pouring Systems. M. Caillon. *Metal Industry,* v. 84, Jan. 29, p. 89-91; Feb. 5, p. 103-104; Feb. 12, p. 123-125; Feb. 19, 1954, p. 145-147.

Includes graphs, photographs, diagrams. (To be continued.)

8425 Casting Titanium. *Metal Industry,* v. 84, Feb. 19, 1954, p. 143-144.

Development work on mold preparation and vacuum furnace. Diagram, photograph, table, radiograph.

8426* The Hot-Air Cupola Furnace, and Its Present-Day Position. (Hungarian.) Ferenc Varga. *Öntöde,* v. 5, no. 1, Jan. 1954, p. 1-9.

Effect of hot air on combustion process, air heating installations, metallurgy of the furnace, and advantages in comparison with cold air cupola furnaces. Graphs, diagrams. 29 ref.

8427* Problems of the Material for the Charge of Modified Cast Iron. (Hungarian.) Gyula Nándori. *Öntöde,* v. 5, no. 1, Jan. 1954, p. 9-17.

High-strength cast irons manufatcured with Hungarian equipment and raw material. Relative merits of cupola and reverberatory furnaces. Diagrams, micrographs, tables. 32 ref.

8428* Problem: To Reduce Mass Without Sacrificing Rigidity. J. B. Lyons and A. M. Cambell. *Precision Metal Molding,* v. 12, Mar. 1954, p. 38-40, 94-95.

Advantages of investment casting over machined and sand cast parts. Photographs, diagram.

8429* Cast Anodes for Cathodic Protection Are 4-Ways Better. Albert Graver. *Precision Metal Molding,* v. 12, Mar. 1954, p. 48-49, 84.

Permanent-mold casting allows control of impurities and a more efficient corrosion pattern. Anodes are easier to attach because core-wire protrudes from the end. Drawing, table, diagram.

8430* Many Factors Affect Linear Shrinkage on Medium, Large Steel Castings. Hubert Chappie. *Western Metals,* v. 12, Feb. 1954, p. 62-64.

Factors causing hindered contraction include effect of mold design; cores; green sand vs. dry sand; pockets in cope calling for excessive gaggering and bars in the flasks; ramming; and several heads on one job. Photographs.

METALS—HEAT TREATMENT

8431* Method of Obtaining Intermediate Structures in Medium Sized Chromium-Molybdenum Steel Cylinders. (German.) Walter Eilender and Heinrich Arend. *Archiv für das Eisenhüttenwesen,* v. 25, nos. 1-2, Jan.-Feb. 1954, p. 85-87.

Tests in oil, water, and 10% NaOH quenches. Graphs. 4 ref.

8432 Investigation of the Mechanism of the Formation of Titanium Carbide in Vacuo. G. A. Meerson and O. E. Krein. *Henry Brutcher, Altadena, Calif., Translation no.* 3121, 17 p. (From *Zhurnal Prikladnoi Khimii,* v. 25, no. 2, 1952, p. 134-147.)

Influence of reduced pressures and of temperature on degree of carburization of Ti. Choice of optimum conditions for producing TiC of theoretical composition. Tables, graphs. 7 ref.

8433 Heat Treating the Surface of Welds in Stainless Steel. M. B. Shapiro. *Henry Brutcher, Altadena, Calif., Translation no.* 3187, 7 p. (From *Vestnik Mashinostroeniya,* v. 32, no. 8, 1952, p. 63-65.)

Experimental study on possible elimination of susceptibility of welded stainless steels to intergranular corrosion by treating surface with high-frequency current. Tables, micrographs, diagram. 2 ref.

8434* Effect of the Rate of Heating on the Formation of Graphitization Centers During the Annealing of Forged Cast Iron. (Russian.) I. I. Khoroshev. *Doklady Akademii Nauk SSSR,* v. 94, no. 2, Jan. 11, 1954, p. 221-223.

Longer, continuous heating in temperature range 250 to 420 C increases number of annealing carbon nodules in modified cast iron. Table. 3 ref.

8435 Heat-Treatment of Spheroidal-Graphite Cast Iron. Marcel Ballay, Raymond Chavey, and Jacques Grilliat. *Foundry Trade Journal,* v. 96, Feb. 4, 1954, p. 125-128.

Hardening by means of quenching after localized heating and annealing for the relief of internal stresses. Tables, graphs, photograph. 2 ref.

8435a Stress Relieving Furnace at Minimum Investment. Fred M. Burt. *Industrial Heating,* v. 21, Feb. 1954, p. 264, 266, 268.

Furnace for stress relieving welded structures. Photographs.

8436* Control of Annealing of Malleable Iron by Its Magnetic Properties. (Russian.) K. P. Zhadnov. *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb., p. 29-30.

Compares results with Brinell hardness measurements. Graphs, micrographs, table.

8437 Carbon Controller for Carburizing and Carbon Restoration. Wayne L. Besselman. *Materials & Methods,* v. 39, Feb. 1954, p. 110-112.

Device for more accurate heat treatment. Photographs, graph.

8438* Heat Treating High-Speed Steels. (Dutch.) J. C. C. Stegwee. *Metalen,* v. 8, no. 21, Nov. 15, 1953, p. 382-388.

Effect of heat treating time and temperature on microstructures and properties of high-speed tool steels. Photomicrographs, tables, graphs.

8439 Surface Hardening Processes for Titanium and Its Alloys. R. W. Hanzel. *Metal Progress,* v. 65, Mar. 1954, p. 89-96.

Results of hardening by O, C, H, B, and N. Graphs, diagram, micrographs, table, photograph. 2 ref.

8440 New Surface Hardening Unit Provides Accurate Temperature Control. Joseph H. Bockrath. *Metal Treating,* v. 5, Jan.-Feb. 1954, p. 2-3, 18.

Gas unit that selectively hardens all types of gears, segments, and cylinders up to 36 in. diameter. Photographs, micrographs.

8441 Facts and Figures on Heat Treating Costs. Horace C. Knerr. *Metal Treating,* v. 5, Jan.-Feb. 1954, p. 4-5, 35.

The "small users" operational costs. Table.

8442 Heat-Treatment of High-Speed Steel. II. Heating High-Speed Steel for Hardening. S. G. Cope. *Metal Treatment and Drop Forging,* v. 21, Feb. 1954, p. 67-74.

Process for hardening and influence of condition prior to treatment on final properties. Distribution and nature of carbides and various factors influencing carbide solution and grain size indicating how mechanical properties are affected by them. Graphs.

8443 Salt Baths. Versatile Performers on the Heat Treating Team. L. B. Rosseua. *Steel,* v. 134, Feb. 15, 1954, p. 108-111.

Basic characteristics that back up present day applications. Photographs, tables, graphs.

Metals—Heat Treatment

See also:
8325 (high alloy castings)
8505 (effect of annealing nodular cast iron)
8598 (effect of Mg on supercooling)
8664 (nitriding of alloy steel)

METALS—MECHANICAL AND PHYSICAL PROPERTIES

8444 Activity of Iron in Iron-Platinum Solid Solutions. (English.) Hugo R. Larson and John Chipman. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 1-2.

Data on contamination of Pt by Fe from melts consisting of calcium oxide and iron oxides under controlled conditions of known activity of Fe and O_2. Diagram, graph, table. 4 ref.

8445 Work-Hardening in Stretched and Twisted Aluminium Crystals. (English.) H. W. Paxton and A. H. Cottrell. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 3-8.

Effect of plastic twisting on tensile deformation of Al crystals. Tables, graphs. 16 ref.

8446 On the Strength of Solid Solution Alloys. (English.) J. C. Fisher. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 9-10.

Short-range order shown as important contributor. 4 ref.

8447 The Formation of Mechanical Twins. (English.) B. A. Bilby and A. R. Entwisle. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 15-19.

Examination of stress fields arising during plastic deformation around inhomogenieties of bounded slip and kink band types. Graphs, table. 16 ref.

8448 Slip Planes and the Energy of Dislocations in a Body-Centered Cubic Structure. (English.) N. K. Chen and R. Maddin. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 49-51.

Modified values of Chalmers and Martius parameter and ratio of Burgers vector to interplanar spacing for planes, are derived assuming an alternate slip process. Table, diagram. 9 ref.

8449 Effect of Neutron Irradiation on a Supersaturated Solid Solution of Beryllium in Copper. (English.) G. T. Murray and W. E. Taylor. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 52-62.

Effect on electrical resistivity, hardness, X-ray line shape and position, and density of a solution annealed Cu-Be alloy. Graphs, tables. 14 ref.

8450 Mechanical Deformation of Aluminium Bicrystals. (English.) R. Clark and B. Chalmers. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 80-86.

Specimens composed of two symmetrically oriented crystals having a common axis were subjected to a tensile test. Photograph, tables, diagrams, micrograph, graphs. 30 ref.

8451 The Change in Resistivity, on Plastic Deformation, of Silver-Copper and Silver-Gold Alloys. (English.) W. H. Aarts and R. K. Jarvis. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 87-91.

Wires of Ag, Au, Cu, Ag-Cu, and Ag-Au alloys were stretched at room temperature, −80 C, and at liquid air point. Change of resistivity and recovery of resistivity on warmnig from low temperatures to room temperature were determined. Graphs, tables. 7 ref.

8452 Crystallography of Deformation by Twin Boundary Movements in Indium-Thallium Alloys. (English.) Z. S. Basinski and J. W. Christian. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 101-116.

Geometrical effects of steps ("twinning dislocations") in twin boundaries of face-centered tetragonal crystals. Diagrams, micrographs. 14 ref.

8453 Lattice Defects and the Electrical Resistivity of Metals. T. Broom. *Advances in Physics*, v. 3, Jan. 1954, p. 26-83.

Theory and experiments. Tables, graphs, diagram. 146 ref.

8454 Direct Fatigue Tests With Tensile and Compressive Mean Stresses on 24S-T Aluminium Plain Specimens and Specimens Notched by a Drilled Hole. (Swedish.) Gunnar Wallgren. *Aeronautical Research Institute of Sweden, Report no.* 48, 1953, 29 p. (TL526 A82r)

Results show range of stress at constant lifetime is noticeably higher for a compressive mean stress than for a tensile mean stress of same magntiude. Graphs, photographs, diagrams, tables. 9 ref.

8455* Twelfth Progress Report of the Rolling-Load Tests of Joint Bars. R. S. Jensen. *American Railway Engineering Association, Bulletin*, v. 55, no. 514, Feb. 1954, p. 814-828.

Reports joint bar wear and failures; revision of design and specifications for new bars; and bars for maintenance repairs. Graphs, micrographs, photographs, tables.

8456* Twelfth Progress Report on Shelly Rail Studies at the University of Illinois. R. E. Cramer. *American Railway Engineering Association, Bulletin*, v. 55, no. 514, Feb. 1954, p. 832-840.

Results of rolling-load tests. Photographs, tables, micrographs.

8457* Final Report on a Three-Dimensional Photoelastic Investigation of the Principal Stresses and Maximum Shears in the Head of a Model of a Railroad Rail. M. M. Frocht. *American Railway Engineering Association, Bulletin*, v. 55, no. 514, Feb. 1954, p. 854-885.

Deals with photoelastic study utilizing recent developments in three-dimensional photoelasticity. Graphs, photographs, diagrams.

8458* Magnetic Permeability of So-Called "Non-Magnetic" Metallic Materials. M. R. Gross. *American Society of Naval Engineers, Journal*, v. 66, Feb. 1954, p. 215-245.

Many "non-magnetic" materials exhibit feeble but measureable magnetic properties such as permeability, coercive force, and residual induction. Graphs, tables, diagrams, photographs. 5 ref.

8459* The Photomagnetic-Electric Effect on Germanium. (French.) Hubert Bulliard. *Annales de physique*, v. 9, 12 me Serie, Jan.-Feb. 1954, p. 52-83.

Studies on action of light, diffusion, and recombination; and action of magnetic field. Diagrams, graphs. 9 ref.

8460* Fatigue Stress and Crystal State. III. Relation Between Crystal Deformation and Hardening or Failure. (German.) Hermann Möller and Max Hempel. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 1-2, Jan.-Feb. 1954, p. 39-60.

Mechanism of fatigue failure characterized by transition from homogeneous to non-homogeneous crystallite deformation and from shear to bending slip. Diagrams, micrographs, tables. 39 ref.

8461* Notch Impact Strength of Soft Fine Grain Steels in Unaged and Aged State. (German.) Heinz Kornfeld. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 1-2, Jan.-Feb. 1954, p. 61-70; disc., p. 70.

Formula based on experiments. Tables, graphs. 5 ref.

8462 A Plastic-Flow Problem Arising in the Theory of Discontinuous Machining. E. H. Lee. *ASME, Transactions*, v. 76, Feb. 1954, p. 189-193; disc., p. 193-194.

Solution applies only while fracture surface is being deformed. Diagrams. 14 ref.

8463* The Thermal and Electrical Conductivity of Copper at Low Temperatures. G. K. White. *Australian Journal of Physics*, v. 6, Dec. 1953, p. 397-404.

Measurements of thermal conductivity from 2 to 160 K and electrical conductivity form 1·4 to 293 K of Cu in strained and annealed states. Diagram, graphs. 16 ref.

8464* The Effect of Tension on the Thermoelectric Properties of Metals. A. J. Mortlock. *Australian Journal of Physics*, v. 6, Dec. 1953, p. 410-419.

Measurements on 11 different metals of the change in thermoelectric power accompanying elastic tensile strain. Tables, graphs, diagram. 16 ref.

8465 Mechanical Properties of Iron-Chromium-Aluminum Ternary Alloys. I. I. Kornilov and V. S. Mikheev. *Henry Brutcher, Altadena, Calif., Translation no.* 3163, 15 p. (From *Stal*, v. 6, no. 2, 1946, p. 99-104.)

Investigates hardness, notched-bar impact values, and tensile properties of ternary Fe-Cr-Al alloys at room temperature and temperatures to 1830 F. Diagrams, graphs, tables, micrographs. 13 ref.

8466 Microhardness of Siliconized Cases. N. S. Gorbunov, A. S. Akopdzanyan, and N. A. Izgaryshev. *Henry Brutcher, Altadena, Calif., Translation no.* 3167, 4 p. (From *Doklady Akademii Nauk SSSR*, v. 91, no. 2, 1953, p. 285-286.)

Previously abstracted from original. See item 3794, v. 3, Mar. 1954.

8467 Contribution to the Theory of Surface Tension of Metals. S. N. Zadumkin. *Henry Brutcher, Altadena, Calif., Translation no.* 3172, 6 p. (From *Zhurnal Fizicheskoi Khimii*, v. 27, no. 4, 1953, p. 502-504.)

Development of a formula for computation of the coefficient of surface tension in terms of total potential barrier on the surface of the metal; work function; and number of nearest neighbors of a particle in the surface layer. Tables. 10 ref.

8468 Embrittlement of Austenitic Chrome-Nickel Steels at High Temperature. I-III. G. Hoch. *Henry Brutcher, Altadena, Calif., Translation no.* 3176-3178, 61 p. (From *Archiv für das Eisenhüttenwesen*, v. 23, nos. 7-8, 1952, p. 257-276.)

Impact stresses after prolonged heating at 570 to 1830 F. Hot tensile tests for steel subjected to gradual stressing at 1110 to 1650 F. Tables, graphs, micrographs. 24 ref.

8469 The Effects of Stress Concentrations on the Rupture Strength of Metallic Materials Subjected to Creep Loading. G. Sachs, D. P. Newman, and W. F. Brown, Jr. *Henry Brutcher, Altadena, Calif., Translation no.* 3179, 17 p. (From *Zeitschrift für Metallkunde*, v. 44, no. 6, 1953, p. 233-239.)

Previously abstracted from original. See item 12759, v. 2, Nov. 1953.

8470* Effect of Stresses on Martensite Transformation. (French.) Charles Crussard. *Comptes rendus*, v. 237, no. 25, Dec. 21, 1953, p. 1708-1711.

Results of a more precise theory are compared to calculations made by Italian mathematicians. 3 ref.

8471* Interpretations of Variations in Resilience of a Metal as a Function of Temperature. (French.) Marcel Prot. *Comptes rendus*, v. 238, no. 2, Jan. 11, 1954, p. 205-207.

Observations offer a simple explanation for fractures in welded construction. Diagrams. 2 ref.

8472* Influence of Gas Absorption on Mechanical Strength of Metal Wire. (French.) Hubert Forestier and Auguste Clauss. *Comptes rendus*, v. 238, no. 2, Jan. 11, 1954, p. 207-209.

Establishes relation between fracture during stretching of fine wire and nature of gas present. Graph, diagram. 4 ref.

8473* New Invariance of the Gage of Electromagnetism and Superconductivity. (French.) Bernard Jouvet. *Comptes rendus*, v. 238, no. 4, Jan. 25, 1954, p. 454-456.

New definition of electromagnetic potential and new invariance of electro-neutrino magnetism facilitates proof of London's equations and understanding of superconductivity mechanism. 4 ref.

8474* New Method of Determining Temper Brittleness of Steels. (French.) Bernard Jaoul and Paul Lacombe. *Comptes rendus*, v. 238, no. 7, Feb. 15, 1954, p. 817-819.

Radioactive elements penetrate under steel surface. Procedure is superior to optic microscopy and is applicable to all corrosion problems. Graphs. 3 ref.

8475* Relation Between Phenomena of Creep and Stress Relaxation in Metals. (Russian.) I. A. Oding, O. V. Sorokin, and N. D. Sazonova. *Doklady Akademii Nauk SSSR*, v. 92, no. 3, Sept. 21, 1953, p. 565-568.

Tests for creep and relaxation of austenite chrome-nickel steel after three separate heat treatments. Graphs. 4 ref.

8476* Theory of Formation and Disintegration of Contact Bridges Between Surfaces During Friction. (Russian.) M. P. Levitskii. *Doklady Akademii Nauk SSSR*, v. 92, no. 4, Oct. 1, 1953, p. 797-798.

Process of convergence of atomic lattices of surfaces during friction. Graph. 5 ref.

8477* Theory of Electroconductivity of Metals at Low Temperatures. (Russian.) A. I. Rezanov. *Doklady Akademii Nauk SSSR*, 92, no. 5, Oct. 11, 1953, p. 935-937.

Compares additional electro-resistance caused in ferromagnetic metals by mechanism of transfer of energy of external 4-s to internal 3-d electrons with the ordinary "phonon" effect. 4 ref.

8478* Electrical Resistance and Transparency of Films of Mg-Sb, Mg-Bi, and Mg-Sn Alloys. (Russian.) G. A. Kurov. *Doklady Akademii Nauk SSSR*, v. 94, no. 2, Jan. 11, 1954, p. 207-208.

Investigates vapor-deposited films on glass plates of various dimensions. Film thickness varied up to 40 μ. Deposition was at a pressure of 10^{-5} mm. of Hg.

8479* Nature of Deformation at Yield Stage of Metals. (Russian.) V. S. Ivanova. *Doklady Akademii Nauk SSSR*, v. 94, no. 2, Jan. 11, 1954, p. 217-220.

Experiments show that in volumes in which step-wise plastic deformation took place, deformation was 2.5% for Fe. Graphs. 9 ref.

8480* Influence of Temperature on the Strength of Brittle Metallic Materials. (Russian.) V. V. Baron and E. M. Savitskii. *Doklady Akademii Nauk SSSR*, v. 94, no. 2, Jan. 11, 1954, p. 269-272.

Tensile and compressive strengths and hardness of Cu; Si; Ni-Si and Cu-Si alloys; Ge; and Co.

8481* Action of a Constant Electric Field on a Suspension of Metals and Semiconductors in Liquid Dielectries. (Russian.) L. G. Gindin, I. N. Putilova, and L. M. Moroz. *Doklady Akademii Nauk SSSR*, v. 94, no. 2, Jan. 11, 1954, p. 277-279.

Behavior of suspensions of Pt and Cu powders and certain semiconductors. Diagram. 4 ref.

8482* Experimental Investigation of Surface Tension of Sodium Amalgams. (Russian.) P. P. Pugachevich and O. A. Timofeevicheva. *Doklady Akademii Nauk SSSR*, v. 94, no. 2, Jan. 11, 1954, p. 285-287.

Investigates surface tension of 56 Na-amalgams containing from 8.10^{-5} to 0.284 at. % of Na. Measurements were performed at 22 C under high vacuum. Graphs. 10 ref.

8483* Deviations From Hooke's Law Within the "Elastic Range". Duncan Morrison. *Engineering*, v. 177, Jan. 29, 1954, p. 141-144.

Apparatus measures very small plastic strains occurring in steel at stresses within the so-called "elastic limit". Measurements are of particular interest in study of damping capacity or elastic hysteresis. Photographs, diagrams, graphs.

8484* Influence of Copper on Some Properties of Gray Iron. (French.) Jacques Foulon and Albert de Sy. *Fonderie*, 1954, Jan., no. 96, p. 3755-3773; disc., p. 3774.

Up to 3% Cu increased tensile strength and hardness; impact resistance was reduced. Results agree with theoretical predictions. Tables, graphs, micrographs. 18 ref.

8485* Electrical Conductivity of the Solid Solutions of Intermetallic Compounds. (German.) G. Busch and U. Winkler. *Helvetica Physica Acta*, v. 26, no. 6, 1953, p. 578-583.

Solid solutions of Mg-Ge-Sn system were investigated for their lattice constants and electrical conductivities. 9 ref.

8486* Effect of Magnetic Field of the Precipitation of Ferromagnetic Phase. Syohei Miyahara and Tadayasu Mitui. *Hokkaido University, Faculty of Science, Journal, ser. II.*, v. 4, Nov. 1953, p. 275-286.

Behavior of ferromagnetic precipitates in non-ferromagnetic phase and mechanism of heat treatment in magnetic field, i.e. so-called field cooling. Micrograph, graphs, diagram. 6 ref.

Metals—Mechanical and Physical Properties

8487 Mechanism of Creep Deformation in High-Purity Aluminum at High Temperatures. Hsing C. Chang and Nicholas J. Grant. *Institute of Metals, Journal,* v. 82, Feb. 1954, p. 229-235 + 5 plates.

Tests were made at 400, 700, and 1100 F with stresses from 50 to 1200 psi. Slip was found to be fundamental mechanism. Graphs, diagrams. 12 ref.

8488 Changes of Damping Capacity in Quench-Ageing Aluminum-Rich Alloys. K. M. Entwistle. *Institute of Metals, Journal,* v. 82, Feb. 1954, p. 249-263.

Tests on Duralumin at constant temperatures up to 65 C. Diagrams, graphs, table. 15 ref.

8489 Some Metallographic Observations of the Creep of Aluminum-Copper Alloys. A. H. Sully and H. K. Hardy. *Institute of Metals, Journal,* v. 82, Feb. 1954, p. 264-265 + 2 plates.

Studies point to importance of grain-boundary stability in creep-resistant alloys. Table. 2 ref.

8490* The Mechanism of Fatigue in Metallic Materials. (Swedish.) B. Ström. *Jernkontorets Annaler,* v. 138, no. 1, 1954, p. 17-38.

Includes diagrams, graphs, tables, photographs, micrographs. 60 ref.

8491* Checking of Methods for Determining the Primary Permanent Elongation. (Swedish.) G. Malmberg. *Jernkontorets Annaler,* v. 138, no. 1, 1954, p. 39-52.

Methods of determining uniform permanent elongation on different types of structural steels. Importance in cold stretched steel emphasized. Graphs, diagrams.

8492 The Heat of Sublimation of Tin and the Dissociation Energy of SnO. Leo Brewer and Richard F. Porter. *Journal of Chemical Physics,* v. 21, Nov. 1953, p. 2012-2013.

Value for Sn combined with heat of formation of gaseous SnO agrees with Birge-Sponer extrapolation to ground-state atoms. Tables. 11 ref.

8493 The Vibrational Spectrum and the Specific Heat of Germanium and Silicon. Yü-Chang Hsieh. *Journal of Chemical Physics,* v. 22, Feb. 1954, p. 306-311.

Substances with diamond structure such as diamond, Ge, Si, and grey tin show that variations of the Debye characteristic temperature can be very large. Tables, graphs. 15 ref.

8494 On the Use of Hodographs in Problems of Plane Plastic Strain. A. P. Green. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 73-80.

Properties and uses of the hodograph of velocity distribution in an ideal plastic-rigid body undergoing plane plastic deformation. Diagrams. 11 ref.

8495 Calculations and Measurements on Wedge-Indentation. J. Grunzweig, I. M. Longman, and N. J. Petch. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 81-86.

Penetration, contact pressure, and slip-line dimensions in plastic identation by a rough wedge are calculated; results compared with experimental measurements. Tables, graphs. 2 ref.

8496 The Plastic Torsion of Anisotropic Bars. R. Hill. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 87-91.

Plastic state of stress is examined in an anisotropic prismatic bar twisted by terminal couples. 7 ref.

8497 Impact of Finite Beams of Ductile Metal. P. S. Symonds and C. F. A. Leth. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 92-102.

Large plastic deformations of a beam under impact are discussed and analyzed. Diagrams, table, graphs. 9 ref.

8498 On Eulerian Co-Ordinates in Elastic Wave Propagation. R. E. D. Bishop and J. N. Goodier. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 103-109.

Stress wave passing through an elastic solid is considered by imagining the disturbance to be stationary and the solid to flow through it. 4 ref.

8499 On Inoue's Hydrodynamical Analogy for the State of Stress in a Plastic Solid. R. Hill. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 110-116.

Mathematical analogy between steady flow of stress in a plastic solid. 9 ref.

8500 Shells With Zero Bending Stresses. M. R. Horne. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 117-126.

Includes graphs, diagrams, table. 1 ref.

8501 On the Stress Distribution in the Walls of Pressure Vessels. H. Fessler and R. T. Rose. *Journal of the Mechanics and Physics of Solids,* v. 2, Jan. 1954, p. 127-136.

Stresses in and near hemispherical end of a pressure vessel of uniform wall thickness and mean diameter to thickness ratio of ten were determined by frozen stress photoelastic method. Diagram, graphs, tables. 7 ref.

8502* Influence of Nitrogen on Surface Tension and Crystallization of Austenitic Steel. (Russian.) N. S. Kreshchanovskii, V. I. Prosvirin, and R. P. Zaletaeva. *Liteinoe Proizvodstvo,* 1954, no. 1, Jan.-Feb., p. 23-24.

Presence of N shows no appreciable influence on primary crystallization. Table, graph, micrographs. 6 ref.

8503 Influence of Heat Treatment and Cold Working on Tensile Strength Ranges. Robert L. Stedfeld. *Machine Design,* v. 26, Feb. 1954, p. 163-173.

Methods for raising strength levels for a number of materials and practical significance. Tables, graphs. 5 ref.

8504* The Creep Deformation of Metals Under Discontinuous Stress and Temperature Conditions. A. J. Kennedy. *Mechanical World and Engineering Record,* v. 134, Feb. 1954, p. 54-57.

Suggests actual behavior of metals subjected to interrupted stresses may be very different from behavior deduced from standard creep tests. Graphs, diagrams. 4 ref.

8505* Chemical Composition and Mechanical Properties of Nodular Cast Iron. (Dutch.) J. Kol. *Metalen,* v. 9, no. 2, Jan. 31, 1954, p. 17-21.

Effect of annealing Mg, Si, C, and S. Graphs, tables. 19 ref. (To be continued.)

8506* A Remark on the Temperature Dependence of Hardness. (Dutch.) E. D. Kunst. *Metalen,* v. 9, no. 2, Jan. 31, 1954, p. 23-24.

Sudden drop in Brinell hardness at about half the melting temperature on the absolute scale and impression depth, as a function of applied load and time in seconds at different temperatures. Graphs.

8507* Contribution to the Study of Elastic Modulus of Metal Alloys. (French.) René Le Roux. *Métaux, Corrosion-Industries,* v. 28, no. 340, Dec. 1953, p. 489-505; v. 29, no. 341, Jan. 1954, p. 24-36.

Variations of Young's modulus at room temperature permit observation of physico-chemical reactions of isothermic decomposition of an eutectoid. Florisson method and apparatus are described. Anisotropy of elasticity. Graphs, tables, diagrams, photograph. 40 ref. (To be continued.)

8508* C.E.C.M. Conference of Dec. 18, 1953. Results of the Statistical Study of the Mechanical Characteristics of Steels A37 and A42. I-II. (French.) H. Herbiet and L. Dor. *Ossature metallique,* v. 19, no. 2, Feb. 1954, p. 93-103.

Tests and statistical results. Tables, graphs.

8509 The Thermal and Electrical Conductivity of Magnesium at Low Temperatures. H. M. Rosenberg. *Philosophical Magazine,* v. 45, 7th ser., no. 360, Jan. 1954, p. 73-79.

Electrical and thermal resistivities of the same specimen have been measured together between 2 and 35 K. Graphs. 12 ref.

8510* An Attempt to Find Anisotropy in the Superconductive Properties of Gallium. A. J. Croft, J. L. Olsen-Baer,

and R. W. Powell. *Philosophical Magzaine*, v. 45, 7th ser., no. 361, Feb. 1954, p. 123-125.

Experiments in temperature range 0.2 to 1 K show dependence of superconductive transition point on crystallographic direction is less than 0.002 K. 6 ref.

8511* Electronic Conduction in Grey Tin. J. T. Kendall. *Philosophical Magazine*, v. 45, 7th ser., no. 361, Feb. 1954, p. 141-157.

Conductivity and Hall constant of grey Sn alloys containing Sb and Ga were measured over a temperature range of 77 to 286 K. Tables, graphs, diagram. 9 ref.

8512* Observations on the Fatigue Fracture of Copper. N. J. Wadsworth and N. Thompson. *Philosophical Magazine*, v. 45, 7th ser., no. 361, Feb. 1954, p. 223-224 + 1 plate.

Experiments were done on pure Cu, fully annealed and tested at constant stress in push-pull at about 1000 cycles per sec.

8513* The Anomalous Skin Effect and the Reflectivity of Metals. IV. Theoretical Optical Properties of Thin Metallic Films. (English.) R. B. Dingle. *Physica*, v. 19, no. 12, Dec. 1953, p. 1187-1199.

Mathematical analysis. Table. 5 ref.

8514* Measurements on the Electrical Resistivity of Thin Nickel Films at Very Low Temperatures. (English.) A. Van Itterbeek, L. De Greve, L. Van Gerven, and K. Sabbe. *Physica*, v. 20, no. 1, Jan. 1954, p. 1-6.

Resistance was very sensitive to temperature and measuring current. Hysteresis was demonstrated. Graphs, tables. 8 ref.

8515 Spectroscopy of the Solid State: Some of the Transition Elements. E. M. Gyorgy and G. G. Harvey. *Physical Review*, v. 93, ser. 2, Feb. 1, 1954, p. 365-369.

Three *P* emission curves of Ni, Mn, and Fe obtained by use of vacuum recording spectrograph. A plausible interpretation of a number of features of experimental bands. Diagrams, tables, oscillograms. 12 ref.

8516 Antiferromagnetism of Manganese. Lyle Patrick. *Physical Review*, v. 93, ser. 2, Feb. 1, 1954, p. 370.

Measurements of resistance and thermoelectric power of Mn show anomlaies near Neél temperature. Evidence of a Mn transition at 100 K. Graph. 3 ref.

8517 The Change of Ferromagnetic Curie Points With Hydrostatic Pressure. Lyle Patrick. *Physical Review*, v. 93, ser. 2, Feb. 1, 1954, p. 384-392.

Measurements on effect of pressure on Curie temperature for 13 ferromagnetic materials. Table, graphs, diagrams. 23 ref.

8518 The Influence of Pressure on the Curie Temperature of Iron and Nickel. R. Smoluchowski. *Physical Review*, v. 93, ser. 2, Feb. 1, 1954, p. 392-393.

Comparison between Patrick's measurements of change of Curie temperature under pressure and theory based on a Brillouin function. 5 ref.

8519 A New Method for Measuring Auger Transitions. Charles E. Roos. *Physical Review*, v. 93, ser. 2, Feb. 1, 1954, p. 401-405.

Fluorescence yields of Zr, Nb, Mo, Rh, Pd, Ag, Cd, and Sn were measured by a new X-ray method involving use of a scintillation counter. Graphs, diagrams, tables. 26 ref.

8520 The Thermal Conductivity of Monovalent Metals. P. G. Klemens. *Physical Society, Proceedings*, v. 67, no. 410A, Feb. 1954, p. 194-196.

Two solutions of integral equation for Bloch's theory of thermal conductivity. 11 ref.

8521* Electrical Measurements at High Temperatures as an Efficient Tool for Thermal Analysis. F. W. Glaser and D. Moskowitz. *Powder Metallurgy Bulletin*, v. 6, Dec. 1953, p. 178-185.

Includes graphs, diagram, photograph. 10 ref.

8522 Thermo-Electricity at Low Temperatures. II. The Alkali Metal Group. D. K. C. MacDonald and W. B. Pearson. *Royal Society, Proceedings*, v. 221, ser. A, Feb. 9, 1954, p. 534-540.

Measures thermo-electric behavior of all alkali metals, together with some alloys, in low-temperature region below 80 K. Graphs. 8 ref.

8523* Strain Measurements on Welded Structures. (German.) A. Erker. *Schweissen und Schneiden*, v. 6, no. 2, Feb. 1954, p. 66-69.

Notch effect at undercuts, effect of initial curvature, and influence of internal stresses. Diagrams, graphs. 8 ref.

8524* On the Internal Friction of Ferromagnetic Substances. (English.) Nobuhiko Kunitomi. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 4, Aug. 1953, p. 287-310.

Microscopic eddy currents calculated as a function of magnetization. Results compared with experimental data. Graphs, tables, diagrams. 20 ref.

8525* On Activities of Coexisting Elements in Molten Iron. II. The Activity of Silicon in Molten Fe-Si System. (English.) Koji Sanbongi and Masayasu Ohtani. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 4, Aug. 1953, p. 350-357.

E.m.f. corresponding to change of Si content in Fe was measured in an electrode concentration cell. Diagram, graphs, tables. 11 ref.

8526* The Measurement of the Young's Modulus of Metals and Alloys by an Interferometre Method. III. The Influence of Heat-Treatment on the Young's Moduli of Fe-Al Alloys, and the Young's Moduli of Ni-Al, Al-Cu Alloys and German Silver in the Annealed State. (English.) Tadao Fukuroi and Yoshio Shibuya. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 5, Oct. 1953, p. 405-412.

Young's modulus was studied as function of heat treatment and alloy compositions. Graphs, tables. 11 ref.

8527* Ferromagnetic Domain Patterns on Nickel Crystals. I. Domain Patterns on the Magnetically Important Surfaces of Unmagnetized Nickel Crystals. (English.) Mikio Yamamoto and Takao Iwata. *Science Reports of the Research Institutes, Tohoku University*, Series A, v. 5, no. 5, Oct. 1953, p. 433-459.

The (110) surface of Ni crystals showed plate, tree, and parallelogram-net patterns. Pattern observed on (211) surface was simple; those on (100) and (111) surfaces were much more complicated. Dot and deformed maze patterns were observed on disturbed surfaces. Micrographs, diagrams. 30 ref.

8528 Possible Sources of Error in Hardness Testing. K. Meyer. *Sheet Metal Industries*, v. 31, no. 322, Feb. 1954, p. 107-113. (Translated from the German by P. Grodzinski.)

Accuracies of basic instruments. Diagram, spectrographs, micrographs. 4 ref. (To be continued.)

8529* Effect of Hardening Temperature on Strength of High Speed Steel R9. (Russian.) E. I. Malinkina. *Stanki i Instrument*, v. 24, no. 12, Dec. 1953, p. 21-23.

Torsion, tension, bending, and impact properties decrease sharply when hardening temperature is increased. Graphs, tables. 2 ref.

8530* Investigation of Plastic Supporting Action in Notched Rods. (German.) E. Siebel and A. Hosang. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 96, no. 4, Feb. 1, 1954, p. 98-101.

Safe average stress in a notched cross section must be below yield stress as determined by tensile test. Graphs, diagrams, tables. 6 ref.

8531* The Theory of Plasticity in Relation to Its Engineering Applications. (English.) Hugh Ford. *Zeitschrift für angewandte Mathematik und Physik*, v. 5, no, 1, Jan. 15, 1954, p. 1-35.

Basic laws of mathematical theory; techniques for solving problems; examples of application of these laws; and techniques to study industrial processes. Diagrams, graphs. 43 ref.

Metals—Mechanical and Physical Properties

8532* Magnetic Investigations on the Nature of the Cumuli in the Precipitate from the Cu-Fe System. (German.) A. Knappwost and G. E. Bockstiegel. *Zeitschrift für Elektrochemie*, v. 57, no. 8, 1953, p. 700-709.

Magnetic measurements on Cu-Fe solid solutions quenched from 1030 C and tempered at above 600 C show the metastability of supersaturated solution is apparent. Graphs, diagrams, table. 27 ref.

8533* Research on the Relationship of Hydrogen Overvoltage and Catalytic Effectiveness of Metal Surfaces. (German.) E. Cremer and R. Kerber. *Zeitschrift für Elektrochemie*, v. 57, no. 8, 1953, p. 757-762.

Catalytic effectiveness of Ni, Cu, Co, and Cu-Zn and Ni-Fe-Mo alloys and rate of electrolytic hydrogen dissociation at same overvoltage. Diagrams, graphs, tables. 22 ref.

8534* On the Age-Hardening of Aluminum-Silver Alloys. VIII. Measurement of the Hall Constants nad Magnetic Susceptibility. (German.) Werner Köster and Adolf Frei. *Zeitschrift für Metallkunde*, v. 44, no. 11, Nov. 1953, p. 495-502.

Effect of heat-treating on Hall constants and magnetic susceptibility of an Al-Ag alloy with 3.9% Cu and 0.5% Si investigated as a means of studying age-hardening process. Experiments and results. Graphs, tables. 10 ref.

8535* On the Properties of Metal Melts. VIII. Internal Friction of Molten Al and Al Alloys. (German.) Erich Gebhardt, Manfred Becker, and Stefan Dorner. *Zeitschrift für Metallkunde*, v. 44, no. 11, Nov. 1953, p. 510-514.

Experiments with a torsion-viscometer to determine internal friction of 99.996 Al and effect of Cu, Mg, Fe, Ti, and temperature on viscosity of the melt. Graphs, tables. 24 ref.

8536* Disturbance of Slip in Al Monocrystals. II. Microscopic Investigation of Slip-Band Pictures and Discussion of Mechanism of Deformation. (German.) Hansheinz Lange and Kurt Lücke. *Zeitschrift für Metallkunde*, v. 44, no. 11, Nov. 1953, p. 514-527.

Investigation revealed broken slip-bands; band of second slippage; groups and streaks of slip-bands; and double, transverse, and unexpected slippage. Diagrams, graphs, micrographs. 29 ref.

8537* Shear Deformation of Long Al Monocrystals. (German.) Herbert Scholl. *Zeitschrift für Metallkunde*, v. 44, no. 11, Nov. 1953, p. 528-536.

Apparatus measures components of effective force and determines conditions under which shear occurs or crystals are bent. Diagrams, graphs, micrographs. 25 ref.

8538* High Frequency Conductivity of Hexagonal Selenium. (German.) H. Rebstock and K. Seiler. *Zeitschrift für Naturforschung*, v. 9a, no. 1, Jan. 1954, p. 49-55.

Measurements of conductivity of test pieces tempered at 217 C for various times with various I content. Diagrams, graphs. 21 ref.

8539* Mechanism of Plastic Deformation. (German.) G. Leibfried and P. Haasen. *Zeitschrift für Physik*, v. 137, no. 1, Feb. 19, 1954, p. 67-88.

Investigates genetic relationships between various stages of plastic deformation of metallic crystals and differences in behavior of cubic face-centered and hexagonal crystals. 52 ref.

Books and Miscellaneous Publications

8540 Dislocations in Crystals. W. T. Read, Jr. International Series in Pure and Applied Physics. 228 p. 1953. McGraw-Hill. (QD931 R22d)

Geometry, crystallography, quantitative theory, and applications of dislocation knowledge.

See also:

7794 (mechanical properties of steel facing on hydro-turbine blades)
7821 (corrosion fatigue of alloy steel)
7824 (properties of Chlorimet 3)
7831 (corrosion fatigue of steel)
7912 (mechanical properties of anodized castings)
7944 (magnetic properties of tin)
7984 (electrical conductivity of metals)
8321 (steam fitting design for 1100 F)
8406 (tensile testing of castings)
8418 (mechanical properties of steel castings)
8436 (mechanical properties of malleable iron)
8543 (manufacture and properties of large forgings)
8598 (effect of Mg on surface tension)
8599 (mechanical properties of austenite steels)
8625 (effects of texture on mechanical properties)
8636 (hardness of Mo alloys)
8652 (magnetic properties of iron compact)
8664 (fatigue resistance of alloy steels)
8792 (index of refraction of Ge)
8993 (strength of welded basic Bessemer steel)
9021 (properties of Ag brazing alloys)
9031 (mechanical properties of welds)

METALS—MECHANICAL WORKING

8541* Calculation of Efforts and Power Demand in the Ehrhardt Process of Making Seamless Pipe. (German.) A. Geleji. *Acta Technica Academiae Scientiarum Hungaricae*, v. 7, nos. 3-4, 1953, p. 477-505.

Theoretical and practical principles for design of equipment. Diagrams. 7 ref.

8542* Carbon-Dioxide Cooling. *Aircraft Production*, v. 16, Mar. 1954, p. 96-102.

Application as coolant in machining operations, methods of delivery to tool-point, and storage. Diagrams, photographs, micrographs, graph.

8543 Manufacture and Properties of Large Forgings. Adolph O. Schaefer. *American Iron and Steel Institute, Preprint*, Dec. 3, 1953, 27 p. (TS300 Am35ta)

Includes photograph, tables, diagrams.

8544 Electrical-Discharge Machining. H. V. Harding, V. E. Matulaitis, and R. C. Stoke. *American Machinist*, v. 98, Mar. 15, 1954, p. 137-148.

Arc machining, its use and applications in fabricating materials that are virtually unmachinable. Photographs, micrographs, oscillograms, diagrams.

8545 Advances in Precision Boring. Robert S. Hahn. *American Society of Tool Engineers, Technical Papers and Panel Discussion*, v. 21, 1953, 9 p.

Difficulties caused by elastic and thermal effects; friction; wear; and vibration in the boring process. Drawings, photographs, graphs.

8546 Discontinuous Chip Formation. N. H. Cook, Iain Finnie, and M. C. Shaw. *ASME, Transactions*, v. 76, Feb. 1954, p. 153-162.

Influence of several variables and examples illustrating principal points. Diagrams, graphs, photomicrographs, table. 8 ref.

8547 Predicting the Angle of Chip Flow for Single-Point Cutting Tools. L. V. Colwell. *ASME, Transactions*, v. 76, Feb. 1954, p. 199-203; disc., p. 203-204.

Includes graphs, diagrams.

8548 Thin Gauge Steel Rolled on Y-Mill in France. *Blast Furnace and Steel Plant*, v. 42, Mar. 1954, p. 336-338.

Equipment, plant layout, and operating procedures. Photographs.

8549 Investigation of Lubricating Action in Deep Drawing Using a Model. S. Ya. Veiler, L. A. Shreiner, and P. A. Rebinder. *Henry Brutcher, Altadena, Calif., Translation no.* 3195, p 6. (From *Doklady Akadamii Nauk SSSR*, v. 73, no. 3, 1950, p. 511-513.)

Simultaneous determination of tangential tensile and radial compressive forces with various amounts of deformation. Diagram, tables. 4 ref.

8550* Influence of Cold Working After Tempering on Phases in Copper-Aluminum Alloys Containing 4% Copper.

(French.) Rene Graf and Andre Guinier. *Comptes rendus*, v. 238, no. 7, Feb. 15, 1954, p. 819-821.

X-ray study of polycrystalline specimen shows that cold working speeds up formation theta prime and theta precipitates. Table. 3 ref.

8551* Influence of Lubricants on the Coefficient of Friction During the Deep Drawing of Metals. (Russian.) S. Ia. Veiler and G. I. Epifanov. *Doklady Akademii Nauk SSSR*, v. 92, no. 3, Sept. 21, 1953, p. 593-595.

Investigations made on steel, brass, and copper test specimens using nonylic acid and butyl and methyl alcohol lubricants. Graph. 6 ref.

8552 How to Press Form Titanium Parts. Paul Maynard and Andrew Eshman. *Iron Age*, v. 173, Mar. 11, 1954, p. 149-152.

Rubber pad, brake, stretch and drop hammer forming used to produce Ti production parts. Photographs, diagram.

8553 Mechanized Sheet and Tinplate Mills. John H. Mort. *Iron & Steel*, v. 27, Feb. 1954, p. 55-60.

Electrical energy consumption. Tables, graphs. (To be continued.)

8554 Electrical Systems for Hot Strip Mills. R. E. Marrs. *Iron and Steel Engineer*, v. 31, Feb. 1954, p. 99-106; disc., p. 106-108.

Width and thickness gages; speed and voltage regulators; individual generators; magnetic amplifiers; and synchronous motors. Circuit diagrams, table, photographs, graphs.

8555 Designing Magnesium Impacts. T. L. Patton. *Machine Design*, v. 26, Feb. 1954, p. 124-128.

Possibilities of designing for lower cost. Photographs, tables, graph, diagrams.

8556 Lubrication in the Cutting of Metals. Antoni Niedzwiedzki. *Machinery (London)*, v. 84, Feb. 12, 1954, p. 337-343.

Considers classification of cutting fluids; properties of cutting oils and aqueous emulsions; and use of compressed gases as cooling media in metal cutting operations. Graphs, diagrams, tables, photographs. (To be continued.)

8557 Deep Drawing of Molybdenum. F. Duckworth. *Machinery (London)*, v. 84, Feb. 19, 1954, p. 389-390.

Mo sheet, 0.010 in. thick, drawn into cylindrical cups with a length to diameter ratio of more than 2:1, using a new deep drawing technique. Diagrams, table, photograph.

8558 Hot Steel Extrusions. Theodore B. Merrill, Jr. *Materials & Methods*, v. 39, Feb. 1954, p. 96-97.

Processes for shapes too complex; alloys too brittle to roll; and small lots of special shapes. Photographs, diagram.

8559 Grinding Hazards. W. R. Hardwick. *Metallurgia*, v. 49, no. 291, Jan. 1954, p. 21-25.

Grinding of tools, accomplished by local heat generation, incorrectly carried out can result in softening and cracking of surface of the tool. Photographs, micrographs, table, graph.

8560* Technical Notes from the 5th International Congress of Mechanical Works in Turin. (French.) *Métallurgie et la construction mécanique*, v. 85, no. 12, Dec. 1953, 30 p.

Includes machining by cutting tools and electricity; finishing, progress in foundry techniques; precision foundry work; stamping, forging, extrusion, flanging and cutting; powder metallurgy; welding procedures; and other joining methods. Graph, diagrams, photographs.

8561 Lubricants for Metalworking. *Metal Treatment and Drop Forging*, v. 21, Feb. 1954, p. 61-65.

Applications in non-ferrous metal industries.

8562 Seven Ways of Forming Magnesium Sheet. *Product Engineering*, v. 25, Feb. 1954, p. 135-141.

Data shows Mg can be fabricated with less trouble than other sheet metals. Graphs, diagrams, tables.

8563 The Forming of Aluminum Sheet. IV. Deep Drawing and Pressing. H. Hinxman. *Sheet Metal Industries*, v. 31, no. 322, Feb. 1954, p. 93-98.

Forming methods adopted with Al and its alloys, show how they compare favorably with others in their response to drawing and pressing. Photographs, diagrams, drawing. 3 ref.

8563a The Forming of Aluminum Sheet. IV. Deep Drawing and Pressing. H. Hinxman. *Sheet Metal Industries*, v. 31, no. 323, Mar. 1954, p. 191-196, 202.

Diameter reduction of cylindrical, rectangular, tapered, and domed shells. Blank-holder pressure, drawing speed, lubrication, and ironing. Diagrams, tables, photographs. (To be continued.)

8564 Control of Strip Thickness in Hot and Cold Rolling by Automatic Screwdown. R. B. Sims and P. R. A. Briggs. *Sheet Metal Industries*, v. 31, no. 323, Mar. 1954, p. 181-190, 203.

Control method uses existing mill screws to re-position rolls and keep strip to gauge. Accuracy of ± .001 in. Charts, diagrams, photographs, graphs, tables. 9 ref.

8565 The Rolling of Metals and Alloys. I. Eustace C. Larke. *Sheet Metal Industries*, v. 31, no. 323, Mar. 1954, p. 241, 248.

Continues discussion on historical development of rolling mill. Graphs, photographs, table, diagram. 11 ref. (To be continued.)

8566 Stampings Offer Way to Cut Corners. *Steel*, v. 134, Feb. 15, 1954, p. 112-113.

Fourteen-part assembly requiring welding, machining, and assembling, incorporated into a single stamping. Photographs.

8567 Coatings in Cold Forming, Dual Role Makes Lubricant Doubly Important. Samuel Spring. *Steel*, v. 134, Mar. 8, 1954, p. 116-119.

Lubricants have a tough act in severe cold forming. Phosphate combinations achieve important success in twin function of surface separator and friction reducing agent. Tables, photographs, micrographs. 4 ref.

8568 A Comparison of American and German Drop Forging Development. Paul Hansen. *Steel Processing*, v. 40, Feb. 1954, p. 77-83.

Difference in productivity may be that manufacturing process in American forging plants, can be designed for an exceptionally high volume of identical parts. Photographs, tables, diagram.

8569 Internal Stresses in Some Types of Forging. I. Charles Sykes. *Steel Processing*, v. 40, Feb. 1954, p. 101-107, 118, 120.

Includes diagrams, graphs, tables. 9 ref. (To be continued.)

8570* Carbide Tool Evaluation. H. O. Warnock. *Tooling and Production*, v. 19, Feb. 1954, p. 45-47, 169.

Tool evaluation as a quality control for consumer and a process control for manufacturer. Photographs, graphs.

8571* How Quality Can Make or Break Carbide Tools. Alfred D. Stevens. *Tooling and Production*, v. 19, Feb. 1954, p. 52-55.

Usable life of a cemented carbide tool is dependent on proper application of its basic characteristics. Photographs, micrographs.

8572* Surface Defects Appearing on Stannous Bronze During Turning. (Russian.) A. P. Kuznetsov and I. I. Sikhonov. *Vestnik Mashinostroenia*, v. 33, no. 11, Nov. 1953, p. 56-58.

Low feed, increased speed, and a large negative rake will reduce number of defects. Photographs, graphs.

8573* The Hot-Working of Metals. (German.) Erich Siebel. *Zeitschrift für Metallkunde*, v. 45, no. 1, Jan. 1954, p. 1-7.

Resistance of various metals as a function of temperature and rate of deformation; special importance ascribed to temperature increase due to working of light metals; and different types of stress condition in various working processes. Graphs, tables, photographs. 5 ref.

Metals—Mechanical Working

8574* Processes in the Hot-Working of Zinc and Zinc Alloys. (German.) Karl Löhberg. *Zeitschrift für Metallkunde*, v. 45, no. 1, Jan. 1954, p. 8-13.

Grain-size reduction as result of hot-rolling or pressing is ascribed to recrystallization. Graphs, photographs, diagrams. 21 ref.

Books and Miscellaneous Publications

8575 The Cold Working of Non-Ferrous Metals and Alloys. Institute of Metals, Monograph and Report Series no. 12. 207 p. 1953. Inst. of Metals, London. (TN758 C67)

From a symposium held at London, Annual general meeting of the Institute, Mar. 14, 1951. Papers separately abstracted.

8576 Fundamental Aspects of the Cold Working of Metals. Maurice Cook and T. Ll. Richards. Paper from THE COLD WORKING OF NON-FERROUS METALS AND ALLOYS. INSTITUTE OF METALS, MONOGRAPH AND REPORT SERIES no. 12, p. 7-26; disc., p. 165-206 + 2 plates. 1953. Inst. of Metals, London. (TN758 C67)

Background study, in light of existing knowledge and concepts, of mechanism of changes taking place when metals and alloys are plastically deformed in the cold state. Micrographs. 37 ref.

8577 Lubricants for the Cold Working of Non-Ferrous Metals. S. F. Chisholm. Paper from THE COLD WORKING OF NON-FERROUS METALS AND ALLOYS. INSTITUTE OF METALS, MONOGRAPH AND REPORT SERIES no. 12, p. 27-44; disc., p. 165-206. 1953. Inst. of Metals, London. (TN758 C67)

Cold rolling and press, tube ,and wire drawing in light of demands they make on lubricants. Suitable lubricants suggested based on practical experience. Table.

8578 The Cold Rolling of Non-Ferrous Metals in Sheet and Strip Form. C. E. Davies. Paper from THE COLD WORKING OF NON-FERROUS METALS AND ALLOYS. INSTITUTE OF METALS, MONOGRAPH AND REPORT SERIES no. 12. p. 45-80; disc., p. 165-206 + 4 plates. 1953. Inst. of Metals, London. (TN758 C67)

Modern technique in production of cold rolled sheet and strip in the two classes of material form bulk of output of the non-ferrous metal mills; Cu and Cu alloys and Al and its light alloys. Diagrams, photographs. 3 ref.

8579 Wire-Drawing Technique and Equipment. F. T. Cleaver and H. J. Miller. Paper from THE COLD WORKING OF NON-FERROUS METALS AND ALLOYS. INSTITUTE OF METALS, MONOGRAPH AND REPORT SERIES no. 12. p. 81-106; disc., p. 165-206 + 4 plates. 1953. Inst. of Metals, London. (TN758 C67)

Principal land marks in development of wire-drawing from earliest beginnings until present times. Present day machines; detailed account of current practice in production of Cu, brass, bronze, and other Cu alloy wire, and Al and alloy wires; and various types of defects encountered. Diagrams, tables, flow-sheets, photographs.

8580 The Deep Drawing and Pressing of Non-Ferrous Metals and Alloys. J. Dudley Jevons. Paper from THE COLD WORKING OF NON-FERROUS METALS AND ALLOYS. INSTITUTE OF METALS, MONOGRAPH AND REPORT SERIES no. 12. p. 107-163; disc., p. 165-206 + 4 plates. 1953. Inst. of Metals, London. (TN758 C67)

Ordinary and special tests applicable to sheet; their limited usefulness in predicting behavior under press; method for routine acceptance testing of sheet under industrial conditions; phenomena of stretcher-strain markings and of season-cracking. Photographs, micrographs, diagrams. 46 ref.

See also:
8462 (plastic flow in discontinuous machining)
8671 (strip rolling measurements)

METALS—METALLOGRAPHY, TRANSFORMATIONS, AND STRUCTURES

8581 Solubility of Carbon in Ferrite. (English.) Mats Hillert. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 11-14.

Solubility of graphite in ferrite determined by a computation. Table, graph. 10 ref.

8582 Transition Metal Diborides. (English.) Benjamin Post, Frank W. Glasser, and David Moskowitz. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 20-25.

Structural characteristics of eight transition metal diborides investigated. Extent of solid solubility appeared to depend mainly on size factors. Tables, diagrams. 14 ref.

8583 Observations on the Structural Changes Accompanying Recovery in Super-Purity Aluminium. (English.) E. C. W. Perryman. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 26-37.

Structure of super-purity Al examined by metallographic and X-ray directly after cold rolling at room and liquid air temperatures. Graphs, tables, photomicrographs. 18 ref.

8584 Interstitial and Vacancy Migration in Cu_3Au and Copper. (English.) J. A. Brinkman, C. E. Dixon, and C. J. Meechan. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 38-48.

Vacant lattice sites and interstitial atoms in excess of equilibrium concentrations have been introduced into alloy Cu_3Au by quenching rapidly from high temperatures and by irradiating with cyclotron particles. Graphs, tables. 21 ref.

8585 Order-Disorder in Cu-Al Alloys. II. The Nature of the Order-Disorder Transformation and Long-Range Order. (English.) Frank E. Jaumot, Jr. and Charles H. Sutcliffe. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 63-74.

Transformations have been studied in Cu-Au alloys containing from 15.5 to 34.2 atomic % Au. Graphs, tables, diagrams. 13 ref.

8586 Coherent Growth of Martensite During Tempering. (English.) T. Ko. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 75-79.

Martensite plates in a 1.5% C, 5.0% Ni steel can, during tempering, thicken or grow into bainite. Photomicrographs. 14 ref.

8587 Solid Solution Formation in the Gold-Nickel System. (English.) B. L. Averbach, P. A. Flinn, and Morris Cohen. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 92-100.

Sizes of ions in Au-Ni solutions, measured from diffuse X-ray scattering, are used to calculate strain energies. Reasonable agreement with observed heats of mixing is obtained. Graphs, tables. 27 ref.

8588 The Crystallography of the β-α Transformation in Titanium. (English.) A. J. Williams, R. W. Cahn, and C. S. Barrett. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 117-128.

Orientation relationships, habit plane, and surface contour associated with martensitic transformation in iodide Ti were investigated. Diagrams, micrographs. 23 ref.

8589 The Crystallography of Martensite Transformations. I-II. (English.) J. S. Bowles and J. K. Mackenzie. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 129-147.

Experiments to obtain a consistent description of atomic displacements. 4 ref.

8590 Experiments on the Martensitic Transformation in Single Crystals of Indium-Thallium Alloys. (English.) Z. A. Basinski and J. W. Christian. *Acta Metallurgica*, v. 2, no. 1, Jan. 1954, p. 148-166.

Transformation from face-centered cubic to face-centered tetragonal phase was studied in alloys containing 18.5% Tl, using ciné-photography and X-ray methods. Diagrams, micrographs. 23 ref.

8591* Metallographic Photomicrography on Small Negatives. (German.) K. Diebold. *Acta Technica Academiae Scientiarum Hungaricae*, v. 7, nos. 3-4, 1953, p. 341-357.

Apparatus, materials, and methods; small film projectors used as illuminating equipment; and methods of increasing illuminating power of enlarging apparatus. Photographs, micrographs.

8592 Direct Observations of Dislocations in Crystals. A. J. Forty. *Advances in Physics*, v. 3, Jan. 1954, p. 1-25 + 24 plates.

Detection, arrays of dislocations, evidence for movement, and state of dislocation. Diagrams, micrographs. 69 ref.

8593 Segregated Graphite in Steel. J. J. Kanter. *American Petroleum Institute, Proceedings*, sec. III, v. 33, 1953, p. 225-229; disc., p. 245-252.

Causes and remedies of graphitization problems. 1 ref.

8594* Physicochemical Investigation of Carbide Phases Derived From Cobalt and Certain Special Cementites. (French.) Jean Drain. *Annales de chimie (Paris)*, v. 8, Nov.-Dec. 1953, p. 900-953.

Studies on preparation, properties, and structures of carbides and carbide phases in Co; influence of Co on properties of cementite; and influence of S on orthorhombic carbides. Tables, graphs. 40 ref.

8595* Investigation of Nickel-Carbon Alloys and Cast Iron. (German.) Erich Scheil. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 1-2, Jan.-Feb. 1954, p. 71-76.

Graphite of these alloys crystallizes directly, not through decomposition of carbide. Graphs, micrographs. 24 ref.

8596* Quick Polishing of Metallographic Microsections From Cast Iron. (German.) Erling Juul Nielsen. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 1-2, Jan.-Feb. 1954, p. 89-92.

Sections with non-metallic inclusions polished first electrolytically, then mechanically. Micrographs, diagram. 14 ref.

8597 Heterogeneity of Austenite. I. A. Oding and M. G. Lozinskii. *Henry Brutcher, Altadena, Calif., Translation no.* 3126, 8 p. (From *Doklady Akademii Nauk SSSR*, v. 89, no. 2, 1953, p. 275-278.)

Observations regarding phenomena of recrystallization of an austenitic steel heated in vacuo at 2100 to 2150 F. Diagrams, micrographs, photograph. 8 ref.

8598 Effect of Magnesium Upon Surface Tension, Supercooling, and Crystallization of Austenitic Steel. N. S. Kreshchanovskii and R. P. Zaletaeva. *Henry Brutcher, Altadena, Calif., Translation no.* 3130, 7 p. (From *Liteinoe Proizvodstvo*, v. 4, no. 3, 1953, p. 20-21.)

Experimental study of influence of Mg additions ranging from 0 to 0.50%. Graphs, micrographs. 4 ref.

8599 Formation and Properties of Delta Iron (Ferrite) and Sigma Phase in Austenitic Chromium-Nickel Steels. I.-II. H. Buchholtz, H. Krächter, and F. Kraemer. *Henry Brutcher, Altadena, Calif., Translation nos.* 3150 and 3151. 22 p. (From *Archiv für das Eisenhüttenwesen*, v. 24, nos. 3-4, 1953, p. 113-125.)

Previously abstracted from original. See item 11016, v. 2, Oct. 1953.

8600 Procedure for Chemical Isolation of Iron Columbide From Austenitic Steel. A. M. Dymov and S. S. Gorelik. *Henry Brutcher, Altadena, Calif., Translation no.* 3164, 5 p. (From *Zavodskaya Laboratoriya*, v. 16, no. 6, 1950, p. 648-650.)

Development of a qualitative method for isolating iron columbide from Cr-Ni-Mo austenitic steel containing Cb in quantities 16 to 20 times the C content. Micrographs. 2 ref.

8601 On the Kinetics of Development of the Graphite Structure in Cast Iron. K. P. Bunin and I. V. Salli. *Henry Brutcher, Altadena, Calif., Translation no.* 3169, 5 p. (From *Doklady Akademii Nauk SSSR*, v. 83, no. 6. 1952. p. 841-842.)

Metallographic study of graphitization of white cast iron specimens vacuum annealed at 1740 F. Micrographs. 2 ref.

8602 Orientation of Cementite in Tempered Carbon Steel. I. V. Isaichev. *Henry Brutcher, Altadena, Calif., Translation no* 3213, 8 p. (From *Zhurnal Tekhnicheskoi Fiziki*, v. 17, no. 7, 1947, p. 835-838.)

X-ray polar projection method. 3 ref.

8603* Influence of Hydrogen or Nitrogen Insertion on Allotropic Transformation Temperature of Cobalt. (French.) André Michel, Jean Drain, and Raymond Bridelle. *Comptes rendus*, v. 238, no. 1, Jan. 4, 1954, p. 107-108.

Extreme purity of metal is indispensable for such studies. Partial irreversibility was found for α-β transformation. 9 ref.

8604* Orientatin of Fine Substructure on Crystal Faces of Aluminum and Its Alloys as Observed in the Electron Microscope. (French.) Pierre Bussy. *Comptes rendus*, v. 238, no. 2, Jan. 11, 1954, p. 247-249.

Attempts to establish nature of variation of orientation from one crystal to another. Micrographs. 3 ref.

8605* Selective Oxidation of a Monocrystal of α Brass. (French.) Noboru Takahashi. *Comptes rendus*, v. 238, no. 4, Jan. 25, 1954, p. 462-463.

Oxidation of Cu_2O and ZnO studied by electron diffraction. Multiple reflection effect noted in case of ZnO. Micrographs.

8606* Effect of Impurities on Allotropic Transformation of Cobalt and Its Alloys. (French.) Jacques Pomey and René Lucien Le Roux. *Comptes rendus*, v. 238, no. 7, Feb. 15, 1954, p. 814-815.

Importance of C, N, Fe, and H in transformation from α to β phase. Large quantities of impurities are necessary for stability in β phase.

8607* Application of Electronic Microdiffraction to Investigation of Phase Transformations of Al-Cu Alloys. (French.) Noboru Takahashi and Charles Fert. *Comptes rendus*, v. 237, no. 25, Dec. 21, 1953, p. 1664-1666.

Method applied to Al-Cu film permits following of phase transformation in crystalline state. Micrographs. 4 ref.

8608* Possible Development of the Dislocation Theory. (Russian.) V. I. Arkharov, G. N. Kolesnikov, and A. N. Orlov. *Doklady Akademii Nauk SSSR*, v. 92, no. 4, Oct. 1, 1953, p. 751-754.

Possibility of correcting basic difficulty of modern dislocation theory. 2 ref.

8609* Effect of Silicon on the Speed of Carbon Diffusion in Austenite. (Russian.) M. A. Krishtal. *Doklady Akademii Nauk SSSR*, v. 92, no. 5, Oct. 11, 1953, p. 951-953.

Dependence of thickness of austenite layer on time at various temperatures. Formula is given. Graph, diagram. 6 ref.

8610* State of Martensite Crystals of Hardened Low-Carbon Steels. (Russian.) G. V. Kurdiumov, M. D. Perkas, and A. E. Shamov. *Doklady Akademii Nauk SSSR*, v. 92, no. 5, Oct. 11, 1953, p. 955-957.

When C steel with 0.1% C is abruptly quenched, martensite has no time to decompose and C is maintained in solid solution. Graphs. 10 ref.

8611 Solutions in Liquid Iron. III. Diffusion of Cobalt and Carbon. D. W. Morgan and J. A. Kitchener. *Faraday Society, Transactions*, v. 50, Jan. 1954, p. 51-60.

Technique determines diffusion coefficients of solutes in liquid Fe. Tables, graphs, diagrams. 20 ref.

8612* Examining Structural Changes in Connection With Secondary Hardening of Low Alloy Boiler Steel by Electronographic Method. (Czech.) Frantisek Králik. *Hutnické Listy*, v. 9, no. 2, Feb. 1954, p. 77-83.

Precipitation of alloy carbides at temperatures between 450 and 700 C considered primary cause for secondary hardening. Tables, micrographs, photographs, graph. 4 ref.

8613 Ageing Curves at 110° C. on Binary and Ternary Aluminium-Copper Alloys. H. K. Hardy. *Institute of Metals, Journal*, v. 82, Feb. 1954, p. 236-238.

Ternary alloys with In or Sn reached peak hardness at shorter ageing times. Graphs. 3 ref.

8614 Structural Ageing Characteristics of Binary Aluminium-Copper Alloys. J. M. Silcock, T. J. Heal, and H. K. Hardy. *Institute of Metals, Journal*, v. 82, Feb. 1954, p. 239-248 + 2 plates.

X-ray studies on single crystals. Data agree with ageing curves. Tables, diagram, graphs. 21 ref.

8615 Formation of Ferrite in Hypo-Eutectoid Plain Carbon Steels. C. Margaretha Hickley and J. H. Woodhead. *Iron and Steel Institute, Journal*, v. 176, Feb. 1954, p. 129-139 + 2 plates.

Studies during isothermal decomposition of austenite. Graphs, micrographs, table. 24 ref.

Metals—Metallography, Transformations, and Structures

8616 Electron Diffraction Study of the Structures of Antimony Electrodeposited on Antimony Cleavage Face. Ling Yang. *Journal of Applied Physics*, v. 25, Feb. 1954, p. 184-188.

Various factors, controlling crystal orientation in electrodeposited metals. Micrographs, diagrams, tables. 3 ref.

8617 Lattice Dynamics of Body-Centered and Face-Centered Cubic Metallic Elements. Jules de Launay. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 1975-1986.

Lattice dynamics, modified to include role which conduction electrons play in acoustical wave motion, leads to relations connecting dynamic parameters with elastic constants and yields the Fuchs relations in an elementary manner. 18 ref.

8618 The Effect of Compression and of Hydrostatic Pressure on the Diffusion Anisotropy in Zinc. T. Liu and H. G. Drickamer. *Journal of Chemical Physics*, v. 22, Feb. 1954, p. 312-319.

Measurements on rate of self-diffusion in single crystals parallel and perpendicular to the *C* axis. Graphs, diagrams, tables. 13 ref.

8619* Heterogeneity of Copper Crystals Produced by Electrolytic Deposit on a Monocrystal of Electrolytically Polished Beta-Brass. (French.) Noboru Takahashi. *Journal de chimie physique*, v. 50, nos. 11-12, Nov.-Dec. 1953, p. 624-628 + 1 plate.

Cu precipitated on plane (211) of β-brass takes on hexagonal and face-centered cubic forms in sub-microscopic twinned state. Orientations between these crystals explained. Phenomena studied by electron diffraction. Micrographs, table, diagrams.

8620 The Wustite Phase in Partially Reduced Hematite. Gust Bitsianes and T. L. Joseph. *Journal of Metals*, v. 6; *American Institute of Mining and Metallurgical Engineers, Transactions*, v. 200, Feb. 1954, p. 150-153.

Study of wüstite phase formed during partial reduction of a cylindrical compact of chemically pure hematite. Photograph, micrographs, graphs, table, spectrogram. 3 ref.

8621* Property of Iron Binary Alloys. (French.) T. G. Owe Berg. *Journal de physique et la radium*, v. 15, no. 2, Feb. 1954, p. 99-100.

Systems formed by combining Fe with elements of higher atomic numbers contain two phases characterized by different electron densities. 3 ref.

8622* Growth and Orientation of Crystallites in Eutectic Alloys. (Dutch.) H. Tober. *Metalen*, v. 8, no. 24, Dec. 31, 1953, p. 429-436.

Microscopic observatons on Pb-Sn alloys of different compositions quenched at various stages of solidification. Micrographs, photographs, diagrams. 4 ref.

8623* History and State of Composition Research. (German.) H. Spengler. *Metall*, v. 8, nos. 3-4, Feb. 1954, p. 107-115.

Survey of binary systems of metals and metalloids. Extensive bibliography arranged in alphabetical order. Tables. 4 ref.

8624* The Sigma Phase in Stainless Steels and Refractories and Its Practical Interest. (French.) Gilles Pomey. *Métallurgie et la construction mécanique*, v. 86, no. 2, Feb. 1954, p. 99-101, 103, 105-106.

General properties of the σ phase. Outlines numerous investigations on its formation and influence on properties of steels. Diagrams, graphs, micrographs. 19 ref.

8625* Practical Effects of the Grain and Texture in Non-Ferrous Metals. (French.) Jean Hérenguel. *Métaux, Corrosion-Industries*, v. 29, no. 341, Jan. 1954, p. 1-13.

Formation of texture during solidification and its effect on mechanical propetries and recrystallization. Micrographs, table, diagrams, photographs. 9 ref.

8626* A Method of Calculating Grains and Its Application. (French.) W. Dickenscheid. *Métaux, Corrosion-Industries*, v. 29, no. 341, Jan. 1954, p. 14-23.

Method for measuring distribution of crystals. Example of application to isothermal recrystallization as a function of time, temperature, and γ-α transformation. Tables, graphs.

8627* Application of Color Micrography to Study of Aluminum, Iron, and Copper by Means of Formation of Thin Films With Interference Shades. (French.) P. Lacombe and M. Mouflard. *Métaux, Corrosion-Industries*, v. 28, no. 340, Dec. 1953, p. 471-488 + 5 plates.

Method gives greater sensitivity to microscopic examination. Micrographs. 60 ref.

8628 On the Validity of Mott's Theory of the Beta-Flow in Polycrystals. Paul Feltham. *Philosophical Magazine*, v. 45, 7th ser., no. 360, Jan. 1954, p. 9-12.

Surveys experimental evidence on activation energy for transient creep. Table. 12 ref.

8629 Slip Lines, Etchpits and Corrosion-pits. A. H. Abdou. *Philosophical Magazine*, v. 45, 7th ser., no. 360, Jan. 1954, p. 105 + 1 plate.

Experiments show etchpits grouped themselves preferentially along slip lines and certain grain boundaries in addition to a general random distribution. 4 ref.

8630 Dislocations in Plastically Deformed Germanium. G. L. Pearson, W. T. Read, Jr., and F. J. Morin. *Physical Review*, v. 93, ser. 2, Feb. 15, 1954, p. 666-667.

Both *n*- and *p*-type Ge rods were deformed by bending. Hall effect, conductivity, and lifetime were measured on both control and deformed samples. Graphs, micrograph. 5 ref.

8631 On the Mechanism of Grain Growth in Metals, With Special Reference to Steel. D. G. Cole, P. Feltham, and E. Gillam. *Physical Society, Proceedings*, v. 67, no. 410B, Feb. 1954, p. 131-137.

Rate of grain growth in initial stages of isothermal austenitizing studied by thermal etching method in plain, eutectoid carbon steel in range 840 to 970 C. Graphs, micrographs. 24 ref.

8632* Anelastic Study on the Diffusion Coefficients of Alpha-Brass. (English.) Nobuhiko Kunitomi. *Science Reports of the Research Institutes, Tohoku University*, ser. A, v. 5, no. 4, Aug. 1953, p. 335-342.

Anelastic relaxation measured in temperature range 20 to 400 C. Chemical diffusion coefficient calculated. Diagram, graphs. 19 ref.

8633* Growth Rates of New Grains During the Primary Recrystallization of Aluminum Plates. (English.) Hideji Suzuki. *Science Reports of the Research Institutes, Tohoku University*, ser. A, v. 5, no. 5, Oct. 1953, p. 413-432.

Effects of impurity, temperature, deformation, and grain size were determined on cold-worked specimens of high-purity Al and Al alloys containing up to 2.0% of Cu. Tables, graphs. 15 ref.

8634* Sigma Phase in Stainless Steel. (Swedish.) Stig-Erik Erikson. *Svetsaren*, v. 18, no. 3, 1953, p. 33-35.

Fe-Cr and Fe-Cr-Ni constitution diagrams, hardness-temperature graphs, and strength properties of welded stainless steel. Tables, graphs, micrographs. 9 ref.

8635* The Electron-Microscopic Investigation of Metal Surfaces With the Aid of Vapor-Deposited Silicon Monoxide Replicas. (German.) Heinz Wilsdorf. *Zeitschrift für Metallkunde*, v. 45, no. 1, Jan. 1954, p. 14-22.

Preparation of replicas, practical applications with resolutions up to 36 A, and first successful electron microscopic recording of an oxide-free metal surface by replica process. Photographs, micrographs, graphs. 40 ref.

8636* The Alloys of Platinum Metals With Molybdenum. (German.) Ernst Raub. *Zeitschrift für Metallkunde*, v. 45, no. 1, Jan. 1954, p. 23-30.

X-ray and metallographic investigations and hardness measurements of alloys of Mo with Rh, Ru, Pd, Os, In, and Pt. Tables, graphs, photomicrographs. 2 ref.

8637* Reactions of Several Magnesium Alloys With Cast-Iron Melts. (German.) Ulrich Zwicker. *Zeitschrift für Metallkunde,* v. 45, no. 1, Jan. 1954, p. 31-35.

Studies were made of effect of key-alloy components on metallographic structure of cast iron. Micrographs, graph.

8638* The Mechanism of Crystal Growth Far From the Phase Equilibrium. (German.) Ludwig Graf. *Zeitschrift für Metallkunde,* v. 45, no. 1, Jan. 1954, p. 36-47.

Rapid crystal growth is a kinetics process. Formation of dendrites in rapidly cooling melts is a normal phenomenon of rapid growth conditions as a manifestation of kinetic equilibrium. Photographs, micrographs. 67 ref.

8639* The Metallography of Light Metals. VII. Investigation of Dendritic Crystallization of Pure Aluminum. (German.) Hans Kostron and Margarete Schippers. *Zeitschrift für Metallkunde,* v. 44, no. 11, Nov. 1953, p. 477-489.

Investigation indicates phenomena of rythmic oscillation during solidification of commercial Al resulting in structural patterns resembling growth rings in trees. Table, diagrams, micrographs. 22 ref.

8640* The Metallography of the Light Metals. IX. Observations on the Structure of Continuously Cast Water-Chilled Ingots of 99.5 Al. (German.) Hans Kostron and Margarete Schippers. *Zeitschrift für Metallkunde,* v. 44, no. 11, Nov. 1953, p. 489-494.

Metallographic study determines freezing rate in various zones. Diagrams, micrographs, photographs. 7 ref.

8641* Contribution to the Crystallization of Al-Si Alloys. (German.) Gustav Gürtler. *Zeitschrift für Metallkunde,* v. 44, no. 11, Nov. 1953, p. 503-509.

Granular and laminar form of Si crystals. Change of anomalous Al-Si eutectic into a normal eutectic is shown to be result of supercooling of phosphorus free alloys. Table, graphs, micrographs. 30 ref.

See also:
7780 (metallography of tin)
7892 (ion diffusion)
7909 (electrolytic polishing)
8460 (relation between crystal deformation and hardening)
8470 (effect of stresses on martensite transformation)
8484 (structure of Cu bearing gray iron)
8502 (influence of N on crystallization of austenitic steel)
8574 (grain size reduction by recrystallization during hot-rolling)

METALS—POWDER

8642* Study of Properties of Sintered Brasses and Bronzes. (Portuguese.) Vicente Chiaverini and Carlos de Revoredo Barros. *ABM (Boletim da associacao brasileira de metais),* v. 9, no. 32, July 1953, p. 313-331.

Determines physical characteristics obtained by powder metallurgy under various conditions of molding pressure and sintering temperature. Proves possibility of producing these alloys by sintering with reasonable density and mechanical-property values. Photographs, micrographs, tables, graphs. 8 ref.

8643* Properties and Applications of Sintered Aluminum. (German and French.) R. Irmann. *Aluminum Suisse,* v. 4, no. 1, Jan. 1954, p. 24-32.

Preparation and mechanical and physical properties of powder. Photographs, graphs, micrographs, tables. 25 ref.

8644 Metal-Ceramic Interactions. IV. Absolute Measurement of Metal-Ceramic Interfacial Energy and the Interfacial Adsorption of Silicon From Iron-Silicon Alloys. W. D. Kingery. *American Ceramic Society, Journal,* v. 37, Feb. 1954, p. 42-45.

Surface and interfacial energies in the system Ni-Al_2O_3 and Ni-ZrO_2 were determined at elevated temperatures by means of equilibrium interfacial angle measurements. Diagrams, graphs, tables. 12 ref.

8645 New Process for the Reduction of Iron Powders. H. Siepmann. *Henry Brutcher, Altadena, Calif., Translation no.* 3192, 12 p. (From *Stahl und Eisen,* v. 73, no. 6, 1953, p. 360-364.)

Previously abstracted from original. See item 7167, v. 2, Aug. 1953.

8646 Cermet Solid Bodies and Coatings for Gas Turbine Engine Blading and Metal Parts. Earle T. Montgomery. *Engineering Experiment Station News (Ohio State University),* v. 26, Feb. 1954, p. 39-40.

Composition and selection of components, properties, techniques, and their value.

8647* Manufacture of Metal Powders by Amalgam Methods. (Czech) Jan Kaloc. *Hutnické Listy,* v. 9, no. 2, Feb. 1954, p. 83-88.

Laboratory production of Fe, Ni, Mn, Co, and Cr powder. Diagrams, micrographs. 11 ref.

8648* Heat Treatment of Iron Powder. (Hungarian.) Ferenc Kardos. *Magyar Kémiai Folyóirat,* v. 60, no. 2, Feb. 1954, p. 37-42.

Method makes iron-powder applicable in telecommunication equipment. Graphs, micrographs.

8649 Sintered Refractory Alloys. A. Carter. *Metallurgia,* v. 49, no. 291, Jan. 1954, p. 8-14.

Metal-refractory alloys for use in gas turbines operating at high temperatures. Tables, micrographs. 27 ref.

8650* Preliminary Results on the Infiltration of Titanium Carbide With Cobalt. Herman Blumenthal. *Powder Metallurgy Bulletin,* v. 6, Dec. 1953, p. 186-188.

Infiltration method, materials used, results. Table. 6 ref.

8651* Self-Lubricating Iron Bearings. (Polish.) W. Cegielski. *Prace Instytutow Ministerstwa Hutnictwa,* 1954, no. 6, p. 338-358.

Developments in manufacturing and utilization; effects of pressing pressure; sintering temperature; and grain size on properties of bearings. Diagrams, tables, graphs, micrographs. 9 ref.

8652* Studies on the Sintering of the Metallic Powder of the Iron Family. I. Magnetic Properties of the Sintered Iron Compact. II. The Effect of the Atmosphere on the Sintered Metallic Compact. (English.) Akinori Takasaki. *Science Reports of the Research Institutes, Tohoku University,* ser. A, v. 5, no. 4, Aug. 1953, p. 358-376.

Effects of porosity, carbon content, and sintering variables on magnetic properties. Diagrams, tables, graphs, micrographs.

8653* Studies on the Sintering of the Metallic Powder of the Iron Family. III. On the Sintering of Cast Iron Powder. IV. Studies on the Sintered M.K. Type Magnet. (English.) Akinori Takasaki. *Science Reports of the Research, Institutes, Tohoku University,* ser. A, v. 5, no. 5, Oct. 1953, p. 469-492.

Studies on cast iron pulverized in a stamp mill and Alnico-type combinations of Fe, Al, and Co powders. Effects of particle size and sintering time and atmosphere were determined. Diagrams, graphs, tables. 4 ref.

8654* Sintering Copper. (German.) O. Kayser, O. Knacke, and I. N. Stranski. *Zeitschrift für Elektrochemie,* v. 57, no. 10, 1953, p. 924-927.

Investigates adherence of Cu sphere to Cu rod at 520 to 730 C as a function of time. Diagrams, graphs, table. 18 ref.

See also:
7515 (production of metal-ceramic bodies)
8338 (stainless steel powder in clutches)

MINING ENGINEERING

8655* Borehole Temperature Measuring Equipment and the Geothermal Flux in Tasmania. G. Newstead and A. Beck. *Australian Journal of Physics,* v. 6, Dec. 1953, p. 480-489.

Instrument using a thermistor and an a.c. bridge circuit, by which temperature measurements in boreholes can be made to 0.01 C. Diagrams, table. 9 ref.

Mining Engineering

8656 Survey of Mining Practice. A. H. Hubbell. *Engineering and Mining Journal*, v. 155, Feb. 1954, p. 113-117.

Reports WC drilling holds its lead, with detachable bits still well ahead of carbide-tipped forged steel in acceptance. (To be continued.)

8657 Survey of Mining Practice. II. Drilling and Rock-Bolting Hold Spotlight Underground. A. H. Hubbell. *Engineering and Mining Journal*, v. 155, Mar. 1954, p. 87-94.

Equipment and procedures. Table.

8658* The Story of TCI Raw Materials: Iron Ore, Coal, Limestone, Dolomite and Explosives. *Explosives Engineer*, v. 32, Jan.-Feb. 1954, p. 9-28.

Describes mining and quarrying operations of Tennessee Coal and Iron Div. of U.S. Steel Corp. Photographs, map.

8659* Iron Ore Mining on the Mesabi Range. D. D. Howat. *Mine & Quarry Engineering*, v. 20, Feb. 1954, p. 52-60.

Changes and modifications of practice on the Mesabi Range are considered under type and size of excavating gear employed; disposal and handling of the over burden; and transport and hoisting of the ore. Photographs.

8660 Metal Mining Roger V. Pierce. *Mining Engineering*, v. 6, Feb. 1954, p. 149-165.

A general review of developments in 1953. Includes "Methods-on-the-Job", R. L. Loofbourow; "Adirondack District, New York", W. J. Linney and W. A. Bloomstran; "Lake Superior District", E. P. Pfleider; "Birmingham District", P. G. Cowin; "Western South Dakota", Wm. C. Campbell; "Tri-State District", S. S. Clarke; "Southeast Missouri", Elmer A. Jones; "Developments at Climax", Robert Henderson; "The Colorado Plateau Area", G. E. Roberts; "Coeur d'Alene District", Roy G. MacFarland; "Montana District", Robert Weisner; "Washington-Oregon-Alaska Districts", Roy Larson; "New Mexico Area", Earl H. Miller; "Arizona District", R. I. C. Manning; "Activity in Mexico", J. C. Archibald; "Eastern Canada", C. D. Borror; "Western Canada", L. T. Postle, W. S. Jewitt, and E. C. Roper; "Recent Trends in Rock Drilling", Robert Adamson; "Concrete Headframes in Sweden", J. Fred Johnson; "Trends in Dredging", H. A. Sawin; and "Rock Bolting in the Pacific Northwest", Paul F. Yopes.

8661* Accelerating Mine Development at Hartebeestfontein Gold Mining. *Mining Journal*, v. 242, Jan. 29, 1954, p. 126-127.

Changes in sources of supply of capital funds necessary to bring new gold mines to production stage has brought about radical changes in development programs and techniques used in establishment of new gold mining properties. Diagram, photographs.

8662 High-Angle Slant-Hole Drilling Under Corpus Christi's Ship Channel. Joseph A. Kornfeld. *Oil and Gas Journal*, v. 52, Feb. 22, 1954, p. 144-146, 148, 150, 152, 155.

Drilling procedure and general statistics. Tables, photographs, diagrams.

8663* Deeper Oil Drilling Aided by Australian Wood Extract. J. W. Morris. *Petroleum*, v. 17, Mar. 1954, p. 99-100.

Important scientific discovery reveals wood extract from white gum forests of Western Australia possesses valuable properties which enable oil engineers to drill bore-holes to greater depths. Photographs.

8664 Nitriding Helps Solve Deep Well Problems. R. L. Chenault and G. E. Mohnkern. *Petroleum Engineer*, v. 26, Mar. 1954, p. 50 + 8 pages.

Hardness, fatigue, and corrosion resistance of sub-surface equipment improved. Diagrams, graphs, table, micrographs. 11 ref.

8665* A Theoretical and Experimental Study of Constant Rate Displacements in Water Wet Systems. J. Jones-Parra, C. D. Stahl, and J. C. Calhoun. *Producers Monthly*, v. 18, Jan. 1954, p. 18-26.

From experimental work and theoretical considerations, it is concluded that there can be no all inclusive generalization as to direction in which recovery will change in laboratory floods over a wide range of variables, nor does it appear possible to arrive at a scaling factor which will correlate all flooding information on laboratory floods for a complete range of variables on a given system. Graphs, tables. 10 ref.

8666* Activity of the Preprospecting Mission of the Bureau of Petroleum Research in the Sedimentary Basins of French West Africa. (French.) P. Maugis. *Revue de l'institut francais du petrole et Annales des combustibles liquides*, v. 9, no. 1, Jan. 1954, p. 3-17, + 5 plates.

Numerous problems regarding petroleum possibilities in French West Africa. Maps, charts. 102 ref.

8667 Diamond Orientation in Diamond Bits. III. Effects of Orienting High-Grade Drill Bort in Diamond-Coring Bit Crowns. Albert E. Long. *U. S. Bureau of Mines, Report of Investigation no.* 5015, Jan. 1954, 13 p. + 4 plates. (TN21 Un3r)

Drill bort were oriented in both hard-and soft-vector directions in crowns of AX-size bits. Tables, photographs.

8668 Determination of Porosity by a Bureau of Mines Method: A List of Porosities of Oil Sands. (Revision of Report of Investigations 4548.) Cleo G. Rall, H. C. Hamontre, and D. B. Taliaferro. *U. S. Bureau of Mines, Report of Investigations no.* 5025, Feb. 1954, 24 p. + 5 plates. (TN21 Un3r)

Improvement of apparatus and test results on 4800 samples from 13 states. Tables, diagrams, photograph. 34 ref.

See also:
8303 (oil well drilling)

NONDESTRUCTIVE TESTING

8669* Ultrasonic Testing of Mass Products in Water Immersion. (English.) G. Keller. *Acta Technica Academiae Scientiarum Hungaricae*, v. 7, nos. 3-4. 1953, p. 359-387.

Testing equipment and methods permit reliable, swift detection and recording of discontinuities. Graphs, tables, diagrams, photographs, X-ray radiographs. 29 ref.

8670* New Possibilities of Non-Destructive Material Testing in Aluminum Manufacturing Industry. (German.) R. Pohlmann. *Aluminium*, v. 30, no. 2, Feb. 1954, p. 57-61.

Importance of supersonic test for determining breaks, segregations, slag inclusions, flaws, and inhomogeneties. Diagrams, photographs. 3 ref.

8671* Sheet-Metal Thickness-Measuring Instrument Especially for Measuring During the Rolling of Strips. (German.) N. de Ball. *Archiv für technisches Messen*, 1953, no. 215, Dec., p. 269-272.

Three different β-ray and two different compressed-air measuring instruments. Photographs, table, diagrams. 10 ref.

8672* Non-Destructive Tests of Field Welds on Welded Pipe Lines. J. H. Lawson. *Australasian Engineer*, 1954, Jan. 7, p. 57-60.

Developments in power station practice have led to adoption of radiographic examination of steam and feed piping operating at higher pressures and temperatures. (To be continued.)

8673 Ultrasonic Testing of Steel Rolls and Steel Cylinders. H. J. Seemann and W. Bentz. *Henry Brutcher, Altadena, Calif., Translation no.* 3118, 11 p. (From *Archiv für das Eisenhüttenwesen*, v. 24, nos. 1-2, 1953, p. 47-52.)

Previously abstracted from original. See item 7658, v. 2, Aug. 1953.

8674 Electromagnetic Alternating-Field Technique for Nondestructive Testing of Ferrous Metals. H. Goebbels. *Henry Brutcher, Altadena, Calif., Translation no.* 3139, 17 p. (From *Archiv für das Eisenhüttenwesen*, v. 23, nos. 11-12, 1952, p. 443-448.)

Equipment developed determines behavior in an alternating field. Photograph, graphs, diagrams, tables. 7 ref.

8675* Summary of Industrial Radiology. (Spanish.) A. Ruiz Rubio. *Ciencia y técnica de la Soldadura*, v. 3, no. 15, Nov.-Dec. 1953, 30 p.

A general review. Diagrams, graphs, tables.

8676 Non-Destructive Testing. R. H. Warring. *Machinery Lloyd (Overseas Ed.)*, v. 26, Jan. 30, 1954, p. 71-74.

Various methods and applications. Tables, diagrams.

8677* Internal Microstrains and the Deformation and Failure of Metals. L. J. Dijkstra, U. Martius, B. Chalmers, and P. E. Cavanagh. *Nondestructive Testing*, v. 12, Jan.-Feb. 1954, p. 13-18.

Usefulness of magnetic methods in estimating and measuring, by nondestructive methods, engineering service to be expected from steels. Micrographs, photograph, diagram. 3 ref.

8678* The Use of Artificially Produced Radioisotopes in Industrial Radiography. W. A. McCarthy. *Nondestructive Testing*, v. 12, Jan.-Feb. 1954, p. 19-20.

Comparison between cost, use, and effects of isotopes and radium and X-rays. 8 ref.

8679* An Investigation of the Application of Iridium 192 Gamma Radiation to the Radiography of Light Metal Castings. Robert V. Wolf and Karl P. W. Wolf. *Nondestructive Testing*, v. 12, Jan.-Feb. 1954, p. 26-29.

An exposure chart for Al indicates penetrameter sensitivities for sections. Radiographs, graphs, tables. 9 ref.

8680* Ten Years' Cooperation Between the Society for Nondestructive Testing and the American Society for Metals. C. G. Lutts. *Nondestructive Testing*, v. 12, Jan.-Feb. 1954, p. 31-36.

History and early experiments in radiography.

8681* X-Ray Focal Spot Measurement. D. Polansky and D. T. O'Connor. *Nondestructive Testing*, v. 12, Jan.-Feb. 1954, p. 37-40.

Finite size of X-ray focal spot is a critical factor in both radiography and fluoroscopy. Modern techniques place a greater emphasis on reduced focal spot size. Photographs, tables. 5 ref.

8682* How to Chase a Pig Through a Pipe. Frank Chapman. *Nondestructive Testing*, v. 12, Jan.-Feb. 1954, p. 41-44.

Newly developed sonic listening device logs progress of the pig through the line; Geiger counter, operating on radio active radiation, locates a stalled pig. Diagrams, photograph.

8683 Nondestructive Testing of Structures. Lloyd J. Oye. *Welding Journal*, v. 33, Mar. 1954, p. 223-233.

Development and economic factors of inspecting welded structures with magnetic particle and penetrant inspection. Value of program as a means of encouraging greater use of welded structures. Graphs, table, photographs. 1 ref.

See also:
8374 (non-destructive testing of electrodes)
8393 (roughness testing of cast metallic pieces)
8994 (ultrasonic inspection of welds)
9005 (interpretation of radiographs)
9029 (non-destructive testing of welded joints)

NUCLEAR PHYSICS, NUCLEONICS, AND RADIATION

8684* The Electron Spectra Produced by a Cobalt 60 Source in Water. Evans Hayward. *American Journal of Roentgenology, Radium Therapy and Nuclear Medicine*, v. 71, Feb. 1954, p. 333-336.

Secondary electrons and their energies, produced by a γ-ray source at various penetrations were measured. Results are discussed. Diagrams, graph. 4 ref.

8685* The Effect of Gamma Radiation on Some Pharmaceutical Products. J. Controulis, C. A. Lawrence, and L. E. Brownell. *American Pharmaceutical Association, Journal, (Scientific Ed.)*, v. 43, Feb. 1954, p. 65-69.

Sterilization of purposely contaminated samples of pharmaceuticals was effected successfully in all products studied. Uncontaminated samples were irradiated under similar conditions to determine possible side effects of γ radiation. Photographs, tables, diagram. 8 ref.

8686 Installation and Operation of Ten-Kilocurie Cobalt-60 Gamma-Radiation Source. John V. Nehemias, L. E. Brownell, W. W. Meinke, and E. W. Coleman. *American Journal of Physics*, v. 22, Feb. 1954, p. 88-92.

Expanding interest in studies of effects of γ radiation upon biological and chemical systems has encouraged production of increasingly higher level sources for various institutions. Photographs, diagrams. 5 ref.

8687* Radioactivity and the Shell Model. S. C. Curran. *Atomics (British)*, v. 5, Feb. 1954, p. 46-54.

Results of experimental studies. Tables, graphs, diagrams. 28 ref.

8688* On the Reaction $^{23}Na(p,\gamma)\ ^{24}Mg$ and the Energy Levels of ^{24}Mg. O. H. Turner. *Australian Journal of Physics*, v. 6, Dec. 1953, p. 380-390.

Energies of γ-rays emitted from 302kv. resonance level of $^{23}Na(p,\gamma)\ ^{24}Mg$ were measured with NaI crystals employed as single crystal spectrometer, scintillation pair spectroments performed on a α-emitters. Photographs, tables, diagrams. 20 ref.

8689 Chemistry of Some Alpha Emitters. Joseph J. Burbage. *Record of Chemical Progress*, v. 14, no. 4, 1953, p. 157-174.

Problems and results associated with experiments performed on α-emitters. Photographs, tables, diagrams, micrographs. 49 ref.

8690* Observation of Stopping of Particles With Masses of 500 to 600 m_e. A. Alikhanian, v. Kirillov-Ugrimov, N. Shostakovich, G. Merzon, and V. Fedorov. *Doklady Akademii Nauk SSSR*, v. 92, no. 3, Sept. 21, 1953, p. 511-513 + 1 plate.

Preliminary results of observation of stopping of above particles in a Wilson cloud chamber connected with a magnetic spectrometer. Diagrams, photographs. 4 ref.

8691* Electron Component and Origin of Cosmic Rays. (Russian.) V. L. Ginzburg and M. I. Fradkin. *Doklady Akademii Nauk SSSR*, v. 92, no. 3, Sept. 21, 1953, p. 531-534.

Brief criticism of work of other authors concerning construction of a theory of origin of cosmic rays. Concludes that their most probable source is "ultranew" stars, of which "fragments" radiate radio waves as result of retardation of electrons in magnetic fields. Table. 18 ref.

8692* Limits of Applicability of the Theory of the "Braking" Radiation of Electrons and the Formation of Pairs at High Energies. (Russian.) L. Landau and I. Pomeranchuk. *Doklady Akademii Nauk SSSR*, v. 92, no. 3, Sept. 21, 1953, p. 535-536.

Analyzes applicability of formulas of Bethe and Heitler for "braking" radiation and pair formation. Presents theoretical basis for conclusion that they do not apply to cases of very high energy. 5 ref.

8693* The Problem of the Motion of Fast Electrons in a Magnetic Field. (Russian.) A. A. Sokolov and I. M. Ternov. *Doklady Akademii Nauk SSSR*, v. 92, no. 3, Sept. 21, 1953, p. 537-540.

Studies quantum corrections to trajectory of motion. 4 ref.

8694* Investigation of Electron Emission During Breaking of Solid Bodies in Vacuum. (Russian.) N. A. Krotova and V. V. Karasev. *Doklady Akademii Nauk SSSR*, v. 92, no. 3, Sept. 21, 1953, p. 607-710.

Method of investigation and results obtained. Diagram. 20 ref.

8695* The Existence of Unstable Charged Particles With a Mass Exceeding the Mass of the Proton. (Russian.) A. Alikhanian, V. Kirillov-Ugriumov, N. Shostakovich, V. Fedorov, and G. Merzon. *Doklday Akademii Nauk SSSR*, v. 92, no. 4, Oct. 5, 1953, p. 719-721 + 1 plate.

Results of measurement of masses of cosmic particles completed at Mt. Alagez in the winter of 1952-53. Diagrams, micrographs. 2 ref.

Nuclean Physics, Nucleonics, and Radiation

8696* Capture of a μ-Meson by a Deuteron. (Russian.) A. Rudik. *Doklady Akademii Nauk SSSR*, v. 92, no. 4, Oct. 1, 1953, p. 739-742.

Investigates five possible variations of interaction of μ-mesons with nucleons in order to determine which of these variations occurs in nature. Table. 4 ref.

8697* Selection of an "Undisturbed" Operator of Energy in the Theory of the Interaction of a Nucleon With a Field of Pseudoscalar Mesons. (Russian.) Iu. V. Novozhilov. *Doklady Akademii Nauk SSSR*, v. 92, no. 5, Oct. 11, 1953, p. 931-933.

Mesons with different moments of amount of motion interact differently with a nucleon. The "undisturbed" energy operator H_0 can be determined as part of the operator H. 7 ref.

8698 Microtrons (Electron Cyclotrons) for X and K Band Operation. H. F. Kaiser. *Franklin Institute, Journal*, v. 257, Feb. 1954, p. 89-108.

Two X-band microtrons were built and successfully operated. Experimental data on operation. Photographs, graphs, diagrams, tables. 19 ref.

8699* The Measurement of Nuclear Moments of Excited States by Angular Correlation Methods. I. (English.) Kurt Alder, H. Albers-Schönberg, Ernst Heer, and T. B. Novey. *Helvetica Physica Acta*, v. 26, nos. 7-8, Sept.-Oct. 1953, p. 761-784.

Angular correlation measurements are well suited for determination of magnetic moment and electric quadrupole coupling in short lived excited states. Tables, graphs. 16 ref.

8700* Preparation of Thin Films of Formvar Used as Suports to Metallic Layers in Nuclear Physics. (French.) P. Barreau, P. Léger, J. Moreau, and P. Prugne. *Journal de physique de le radium*, v. 15, no. 1, Jan. 1954, p. 4A-7A.

Procedures used in French atomic energy laboratories. Photographs, graphs. 2 ref.

8701* Investigation of the Amplification Factor in the Saclay Pile. (French.) B. Jacrot, F. Netter, and V. Raievski. *Journal de physique et le radium*, v. 15, no. 1, Jan. 1954, p. 31A-38A.

Methods applied determine effect of heavy water level and position of adjusting plates on reactivity. Graphs. 7 ref.

8702* Computation of Flux of Thermal Neutrons by Lithium Impregnated Nuclear Photographic Emulsions. (French.) Concèle Gimenez and Jacques Labeyrie. *Journal de physique et le radium*, v. 15, no. 1, Jan. 1954, p. 38A-44A.

Method was shown to be sensitive and require less precaution for storage and emulsion development. Micrographs, tables, graphs. 18 ref.

8703 Reactor Power Calibration. M. A. Schultz and J. C. Connor. *Nucleonics*, v. 12, Feb. 1954, p. 8-12.

Thermal measurements look like the best approach to power reactor control. Graphs, diagram. 2 ref.

8704 Photovoltaic Scintillation Detector for High Dose Rates. I. The Detector. R. L. Schuch, R. D. Hiebert, and F. N. Hayes. **II. Scintillator High-Level Response.** F. N. Hayes, R. D. Hiebert, Betty Rogers, and R. L. Schuch. *Nucleonics*, v. 12, Feb. 1954, p. 16-18.

Instrumentation and response data for liquid and solid (plastic) scintillator solutions at high dose rates. Photograph, graph, diagrams, table. 3 ref.

8705 Multigroup Methods for Neutron Diffusion Problems. R. Ehrlich and H. Hurwitz, Jr. *Nucleonics*, v. 12, Feb. 1954, p. 23-30.

An essential factor in reactor design is neutron flux space-energy distribution. Methods are developed and applied to an actual analysis. Graphs, tables.

8706 Experimental Techniques in Beta-Ray Spectroscopy. II. C. Sharp Cook. *Nucleonics*, v. 12, Feb. 1954, p. 43-47.

Techniques used to surmount problems of producing, measuring, and controlling required magnetic field for G-M and scintillation counters. Diagrams, graph. 52 ref.

8707 Angular Distributions of 22-Mev Protons Elastically Scattered by Various Elements. Bernard L. Cohen and Rodger V. Neidigh. *Physical Review*, v. 93, ser. 2, Jan. 15, 1954, p. 282-287.

Experimental methods show all characteristics of diffraction scattering including at least two maxima and minima for each element. Angles at which these occur can be traced from element to element through the periodic table, following a λ/R dependence with fairly good accuracy. Graphs, photograph. 16 ref.

8708 The Theory of the Deuteron Stripping Reactions. N. C. Francis and K. M. Watson. *Physical Review*, v. 93, ser. 2, Jan. 15, 1954, p. 313-317.

Deuteron stripping reactions are analyzed from the point of view of the many-body problem. A rigorous formal solution is given. 12 ref.

8709 The Elastic Scattering of Protons by Alpha Particles. S. Sack, L. C. Biedenharn, and G. Breit. *Physical Review*, v. 93, ser. 2, Jan. 15, 1954, p. 321-325.

The p 1/2 and p 3/2 phase shifts determined from analysis of elastic scattering of protons by α-particles are treated in terms of a potential interaction between proton and α-particle core, with a spin-orbit interaction of the Thomas type. Results are sensitive to well shape chosen and favor a Gauss well interaction. Limitations of this type of treatment are discussed. Graph. 14 ref.

8710 Some Predicted Effects of Temperature Gradients on Diffusion in Crystals. A. D. LeClaire. *Physical Review*, v. 93, ser. 2, Jan. 15, 1954, p. 344.

Flow of defects may occur as a direct result of temperature gradient as well as indirectly through gradient of local equilibrium concentrations. 2 ref.

8711 Further Correlation Between Magnetoresistance Variations and the de Haas-van Alphen Effect. Ted G. Berlincourt and John K. Logan. *Physical Review*, v. 93, ser. 2, Jan. 15, 1954, p. 348-349.

Includes graphs. 6 ref.

8712 The Specific Ionization and Energy Loss of a Fast Charged Particle. J. R. Allen. *Physical Review*, v. 93, ser. 2, Jan. 15, 1954, p. 353-354.

Includes graph, table. 9 ref.

8713 μ-Meson Decay, β Radioactivity, and Universal Fermi Interaction. L. Michel and A. Wightman. *Physical Review*, v. 93, ser. 2, Jan. 15, 1954, p. 354-355.

Data on μ decay and β radioactivity can be reconciled with a universal Fermi interaction but the most often proposed interactions are excluded. 14 ref.

8714 Spins and Parities of Energy Levels in Pb^{208}. L. G. Elliott, R. L. Graham, J. Walker, and J. L. Wolfson. *Physical Review*, v. 93, ser. 2, Jan. 15, 1954, p. 356.

Includes graphs. 3 ref.

8715 Theory of Bremmsstrahlung and Pair Production. I. Differential Cross Section. H. A. Bethe and L. C. Maximon. **II. Integral Cross Section for Pair Production.** Handel Davies, H. A. Bethe, and L. C. Maximon. *Physical Review*, v. 93, ser. 2, Feb. 15, 1954, p. 768-784, 788-795.

Mathematical discussion without use of Born approximation, assuming energy of electron to be large compared to mc^2 both in initial and final state. Graphs, table, diagram. 55 ref.

8716 Gamma Rays Excited by the Inelastic Scattering of Neutrons in Lead, Bismuth, Iron, Nickel, and Chromium. M. A. Rothman and C. E. Mandeville. *Physical Review*, v. 93, ser. 2, Feb. 15, 1954, p. 796-799.

Using neutrons of d-D reaction at an energy of 3.9 m.e.v., γ-rays were excited. Energies were measured by scintillation spectrometry. Graphs, table, diagram. 11 ref.

8717 Isotope Shifts in the Atomic Spectrum of Calcium. Anne Pery. *Physical Society, Proceedings*, v. 67, no. 410A, Feb. 1954, p. 181-185.

Comparison with analogous transitions in Mg indicates specific mass effect shows a similar behavior in both elements. Tables. 10 ref.

8718* An Improved Clinical Dosimeter for the Measurement of Radiation. S. O. Fedoruk, H. E. Johns, and T. A. Watson. *Radiology*, v. 62, Feb. 1954, p. 177-182; disc., p. 182.
Ionization chambers and amplifiers of instrument designed for use during X-ray and radium treatment. Diagrams, photograph. 6 ref.

8719 Precision Measurement of Uniformity of Materials by Gamma-Ray Transmission. Arthur I. Berman and John N. Harris. *Review of Scientific Instruments*, v. 25, Jan. 1954, p. 21-29.
Thickness and density of materials of constant mass absorption coefficient is determined by measurements of variation in γ-ray transmission. Oscillographs, diagrams, photograph, graphs, table.

8720 *S*-Particles and Charged *V*-Particles. C. C. Butler. *Royal Society, Proceedings*, v. 221, ser. A, Jan. 27, 1954, p. 339-350 + 4 plates.
Discusses known properties of unstable S-particles and charged V-particles, other than their lifetimes. Graph, tables. 22 ref.

Books and Miscellaneous Publications

8721 Fluorescence of Solutions. E. J. Bowen and Frank Wokes. 91 p. 1953. Longmans, Green and Co., London. (QC477 B67f)
Elementary account of process of light absorption and emission; of factors influencing fluorescence; kinetics of fluorescent quenching; principles and apparatus used for fluorescence excitation and measurement, giving an account of construction and use of commercial fluorimeters and of methods of evaluating the results.

See also:
7499 (α and β ray sterilization)
7832 (radioactive tracers in corrosion study)
7968 (resolution in scintillation spectrometers)
8001 (effect of atomic energy on electric companies)
8204 (measuring radioactivity in water)
8223 (nuclear reactors)
8315 (radioactive isotopes in industry materials substitution —book)
8869 (contamination of water by radioactive wastes)
8870 (radioactivity in water supplies)

OPERATIONS RESEARCH AND MANAGEMENT ENGINEERING

8722* Management Makes Safety Pay. *American Gas Association Monthly*, v. 36, Feb. 1954, p. 9-12.
It is economically sound and profitable to prevent accidents. Photographs, tables.

8723 How to Coordinate Subcontracting to Meet Production Schedules. George E. Fouch. *American Machinist*, v. 98, Feb. 15, 1954, p. 137-144.
More than 4,000 companies, predominately in the "small business' catagory, form the sub-contracting and suppliers network which provides most of the components for the J-47 jet turbine. To achieve coordinated control over this vast network, General Electric maintains an extensive sub-contracting organization. Whether your contracts are "prime" or "sub" this study should prove a valuable planning aid. Graph, table.

8724 A Philosophy for Developing Employees. Colonel Lyndall F. Urwick. *American Petroleum Institute, Proceedings*, sec. III, v. 33, 1953, p. 24-28; disc., p. 28-29.
Importance of industry's plans and programs to train future executives.

8725* The Use of Runs to Control the Mean in Quality Control. H. Weiler. *American Statistical Association Journal*, v. 48, no. 264, Dec. 1953, p. 816-825.
Includes table, graphs. 15 ref.

8726 Investing in Industrial Research. Jeremy C. Jenks. *Analysts Journal*, v. 10, Feb. 1954, p. 23-25.
Evaluation of scientific research by private industry.

8727* Enhancing Our Potential Research and Development. R. E. Gibson. *Armed Forces Chemical Journal*, v. 7, July 1953, p. 26-32.
Setting of significant and well-understood objectives; establishment of swift and certain channels of communication and of a well stocked base from which to advance; and efficient utilization of men and their attributes were shown to be cardinal points in the field of research and development. Diagrams.

8728 The Work-Sampling Technique. A. J. Rowe. *ASME, Transactions*, v. 76, Feb. 1954, p. 331-335.
Elaborates on application of basic principles to measurement of factory activities. Tables, graphs, diagram. 9 ref.

8729* Functions of the Safety Engineer in Industry. William V. Kahler. *Bell Telephone Magazine*, v. 32, Winter 1953-54, p. 238-246.
Objectives and methods of achieving them. Photographs, drawings.

8730 How a Research Foundation Works. *Canadian Chemical Processing*, v. 38, Feb. 1954, p. 78-80.
Production of cellulose facial tissues is controlled and developed by Ontario Research Foundation scientists in collaboration with manufacturers. Photographs.

8731 Research. A Case for Competition. *Chemical Week*, v. 74, Feb. 27, 1954, p. 71-72, 74-75.
Arguments for and against tax-free research institutes. Presents case of industrial organizations who charge unfair competition. Gives answers to these complaints by setting forth unique services performed by the not-for-profit groups. Photographs.

8732* The Nature of Management. Peter F. Drucker. *Dun's Review and Modern Industry*, v. 63, Feb. 1954, p. 45-49.
Emergence of management as an essential, distinct, and ruling institution is a pivotal event in social history.

8733 Human Engineering in Control Systems. Alex E. Javitz. *Electrical Manufacturing*, v. 53, Mar. 1954, p. 100-111.
Capabilities and limitations of human components have to be designed into overall systems operation, systems performance, and even systems maintenance. Fundamental human-engineering principles and considerations are reviewed and case histories presented. Diagrams, tables. 11 ref.

8734* Handling Analysis. Prerequisite for Cost Control. C. J. Schwarzer. *Flow*, v. 9, Mar. 1954, p. 61-65, 133-134.
Taken from a paper presented to Material Handling Div., annual meeting of ASME. One company defines, determines, and controls costs of handling. Charts.

8735* Thinking Ahead. John F. Chapman. *Harvard Business Review*, v. 32, Mar.-Apr. 1954, 8 p.
Trends in executive development.

8736 Industrial Hygiene. H. H. Schrenk. *Industrial and Engineering Chemistry*, v. 46, Feb. 1954, p. 101A-103A.
Reports on analytical methods, toxicity, treatment of poisoning, and other topics published in 1953.

8737 Plant Management. A. P. Beutel. *Industrial and Engineering Chemistry*, v. 46, Mar. 1954, p. 105A-106A, 108A.
Lack of communication results in economic losses to American industry every day.

8738 Safety. V. R. Croswell. *Industrial and Engineering Chemistry*, v. 46, Mar. 1954, p. 117A-118A.
Ventilation controls hazards by reducing solvent content of atmosphere below maximum allowable concentration. Tables.

8739 Management and the Engineers. T. C. Rives. *Institute of Radio Engineers, Transactions, Professional Group on Engineering Management*, PGEM-1, Feb. 1954, p. 3-7. (TK1 In6.6t)
Manager qualifications engineers should strive for.

8740 An Engineering Incentive Problem. Harold Goldberg. *Institute of Radio Engineers, Transactions, Professional*

Operations Research and Management Engineering

Group on Engineering Management, PGEM-1, Feb. 1954, p. 7-9. (TK1 In6.6t)

Necessity of coordination between design and production.

8741 Staff Engineer's Part in Control of Design and Development Costs. Harold G. Purinton. *Institute of Radio Engineers, Transactions, Professional Group on Engineering Management*, PGEM-1, Feb. 1954, p. 9-16. (TK1 In6.6t)

Function of staff engineer and "tools" used in control of engineering expenditures. Techniques of bid estimating, project progress reporting, and scheduling. Graphs, drawings.

8742 How Design Quality Control Can Help Engineering. Charles E. Ellis. *Institute of Radio Engineers, Transactoins, Professional Group on Engineering Management*, PGEM-1, Feb. 1954, p. 17-24. (TK1 In6.6t)

Design quality control, properly organized and carried out, helps design products for optimum economy by giving information that is not ordinarly available. Graphs, tables.

8743 An Informational Approach to Organization and System Engineering Design. Jerome Rothstein. *Institute of Radio Engineers, Transactions, Professional Group on Engineering Management*, PGEM-1, Feb. 1954, p. 25-29. (TK1 In6.6t)

Form and potentialities of informational approach to organization.

8744 The Role of the Military Laboratory in Electronics Research and Development. Herbert Sherman. *Institute of Radio Engineers, Transactions, Professional Group on Engineering Management*, PGEM-1, Feb. 1954, p. 30-43. (TK1 In6.6t)

Role of military laboratory in electronics research and development through each phase leading to operational equipment. Function examined with particular regard for special tasks implied for laboratories.

8745* Operator Variation in Experimental Research. J. C. Griffiths and M. A. Rosenfeld. *Journal of Geology*, v. 62, Jan. 1954, p. 74-91.

Presence of operator variation shown to be a common feature in all experimental procedures. Variation is caused by differences arising from a constant bias characteristic of each operator and inconsistent differences within one operator and among a group of operators. Effects of these two kinds of operator variation are illustrated from experiments in the analysis of sedimentary rocks, field mapping, and various other aspects of scientific investigation. Tables, graphs. 26 ref.

8746* How to Make Your Time Study Standards More Accurate—More Salable. Harold R. Nissley. *Machine and Tool Blue Book*, v. 49, Mar. 1954, p. 200-208.

Time study methods and techniques. Charts.

8747* Understanding Security. James R. Kent. *Military Review*, v. 34, Apr. 1954, p. 18-22.

Entire personnel security system is dependent upon efficiency and accuracy of personnel and machinery employed to install, enforce, secure, and maintain our national security program.

8748* A Management Blind Spot. C. W. Kennedy. *Modern Machine Shop*, v. 26, Mar. 1954, p. 240 + 16 pages.

Points out how much of a blind spot exists in connection with one particular function of finding out whether a factory's output meets required specifications.

8749* Quality Control Through Statistical Methods. V. Control Charts. VI. Additional Control Chart Applications. Norbert Lloyd Enrick. *Modern Textiles Magazine*, v. 35, Feb., p. 35, 72, 74-75; Mar. 1954, p. 44, 74-77.

Controls charts represent one of the most widely applied tools for management's supervision over quality of processing. Diagrams, table.

8750* Operations Analysis in the United States Air Force. Leroy A. Brothers. *Operations Research Society of America, Journal*, v. 2, Feb. 1954, p. 1-16.

Modified from paper at the Informal Seminar on Operations Research, John Hopkins University, Oct. 6, 1953. Conditions necessary for successful operations analysis. Graph. 2 ref.

8751* The Problem of Testing for the Fraction of Defectives. J. V. Breakwell. *Operations Research Society of America, Journal*, v. 2, Feb. 1954, p. 59-69.

Revised from paper at Operations Research Society Meeting, Cleveland, May 1953. Graphs. 5 ref.

8752 Statistical Quality Control. John F. Walter. *Petroleum Refiner*, v. 33, Feb. 1954, p. 149-152.

Application of tool to fractionating tower has reduced product quality variability. Charts, table.

8753* Productive Maintenance. I. The Key to Greater Plant Efficiency and Increased Productivity. H. Beale and H. F. McCullough. *Plant*, v. 9, Mar. 1954, p. 32-36.

Compares cost of unforeseen breakdowns of equipment due to inefficient maintenance program, with lower costs of planned, periodic overhauls. Photographs, graphs.

8754 Applications of Dimensional Analysis. E. S. Sellers. *Research*, v. 7, Feb. 1954, p. 72-78.

12 ref.

8755* National Information. (Spanish.) *Revista de ciencia aplicada*, v. 7, no. 35, Nov.-Dec. 1953, p. 546-557.

General review of current activities of several leading Spanish technical institutes.

8756* Maximization of Return From Limited Resources. Wade L. Fite. *Society for Industrial and Applied Mathematics, Journal*, v. 1, Dec. 1953, p. 73-90.

Variable function describes distribution of resources, in such a way that return is maximized. Graph.

8757 Safety Factors in Metal Processing Products. James McElgin. *Steel Processing*, v. 40, Feb. 1954, p. 87-89, 127.

Cutting oil concentrates, hydraulic fluids, rust preventives, and cleaning solutions are four major points covered. Photographs.

Books and Miscellaneous Publications

8758 Sample Survey Methods and Theory. Morris H. Hansen, William N. Hurwitz, and William G. Madow. Wiley Publications in Statistics. v. I-II. 683 and 332 p. 1953. John Wiley & Sons, Inc. (QC276.5 H19s)

Presents in comprehensive form theory of sampling as it exists today and its application to practical problems.

8759 University Patent Policies and Practices. Archie M. Palmer. 229 p. 1952. National Research Council, National Academy of Sciences, Washington, D. C. (T215 P18u)

Publication on non-profit research and patent management, prepared on the basis of extensive surveys of the policies, practices, and procedures of universities, colleges, technological institutes, and professional schools in the U.S. and Canada.

8760 The Writings of the Gilbreths. William R. Spriegel and Clark F. Myers, editors. The Irwin Series in Industrial Engineering Management. 513 p. 1953. Richard D. Irwin, Inc., Homewood, Ill. (T58 G37w)

Chapters cover field, concrete, and bricklaying systems; primer of scientific management; motion, applied motion, and fatigue studies; motion study for the handicapped; and the psychology of management.

See also:
7516 (electronic and automatic controls)
7699 (toxicity of industrial organic solvents—book)
7970 (computers in industrial research)
8162 (time study camera)
8234 (supervisory control)

PHYSICS

8761* Sensitization of Selenium Photoelements to the Infrared by Mercury Vapour. (English.) P. Selényi. *Acta Physica Academiae Scientiarum Hungaricae*, v. 3, no. 2, 1953, p. 65-73.

Investigation shows color sensitivity curve is shifted far into

infra-red and a new maximum appears at about 1000 mμ, which can be ascribed to formation of a HgSe layer. Tables, graph, diagrams.

8762* An Empirical Acoustic Criterion. (English.) T. Somerville. *Acustica,* v. 3, no. 6, 1953, p. 365-369.

Derivation of a tentative empirical acoustic criteria related only to acoustic characteristics which are directly audible. Graphs. 14 ref.

8763* The Acoustic Impedance of a Porous Layer at Oblique Incidence. (English.) J. S. Pyett. *Acustica,* v. 3, no. 6, 1953, p. 375-382.

Specific normal impedance of a layer of anisotropic porous material for a plane wave incident in any direction was calculated in terms of two propagation parameters of the material. Diagrams, graphs. 15 ref.

8764* The Response of a Spherical Fluid Particle Suspended in Air to Irradiation With Sound at the Natural Frequency of the Particle. (English.) T. G. Hodgkinson. *Acustica,* v. 3, no. 6, 1953, p. 383-390.

Particle velocity on surface of drop was determined as a function of densities and viscosities of liquid and gas; surface tension of gas-liquid surface; and potential of the component frequency of the irradiating wave. Diagram, tables. 3 ref.

8765* Investigation of Magnetostriction Vibrators at Frequencies Between 80 and 500 Kc. Per Sec. (German.) Georg Steinkamp. *Acustica,* v. 3, no. 6, 1953, p. 399-404.

Different kinds of damping found in magnetostriction vibrators. Diagrams, graphs, tables. 4 ref.

8766* Pulse Method for Measuring Reflection of Water-Borne Sound in Tubes. (German.) Walter Kuhl, Hermann Oberst, and Eugen Skudrzyk. *Acustica (Supplement),* v. 3, no. 3, 1953, p. 421-433.

Permits determination of amounts and phase angles of reflection factors of absorber samples. Diagrams, photographs, graphs. 8 ref.

8767* Measurement of Efficiency of Liquid Transducers. (German.) H. Thiede. *Acustica (Supplement),* v. 3, no. 3, 1953, p. 449-451.

Formula developed permits determination of efficiency. Diagram, graph. 3 ref.

8768 Quantum Mechanics and Thermodynamic Continuity. II. Alfred Landé. *American Journal of Physics,* v. 22, Feb. 1954, p. 82-87.

Program of deducing quantum mechanics from postulate of thermodynamic continuity is extended to embrace principles of symmetry and quantum statistics. 4 ref.

8769 Ionization Processes in the Electrical Breakdown of Gases. F. Llewellyn Jones. *British Journal of Applied Physics,* v. 5, Feb. 1954, p. 49-53.

Based on a lecture at the Conference on Ionization Phenomena in Discharges, Clarendon Laboratory, Oxford, July, 1953. Properties of breakdown involving spatial-temporal development of currents, breakdown under impulse voltages, under non-uniform fields, and in highly compressed gases at very high voltages. 23 ref.

8770* Influence of Ion Diameters of Rare Earths on Ferromagnetic Properties of Their Ferrites. (French.) Georges Guiot-Guillain. *Comptes rendus,* v. 237, no. 25, Dec. 21, 1953, p. 1645-1656.

Relation between Curie ferromagnetic points and ion diameters. Table, graph. 5 ref.

8771* Photoelectric Method of Recording the Variation With Time of the Spectra of Light Flashes. (Russian.) M. P. Vaniukov and L. D. Khazov. *Doklady Akademii Nauk* SSSR, v. 92, no. 3, Sept. 21, 1953, p. 523-524.

Method of recording a spectrum in such a manner as to obtain curve of the spectral distribution of a given radiation directly at any given moment of time. Diagram, graphs. 5 ref.

8772* Photoluminescence of PbS in the Infrared Region of the Spectrum. (Russian.) L. N. Galkin and N. V. Korolev. *Doklady Akademii Nauk SSSR,* v. 92, no. 3, Sept. 21, 1953, p. 529-530.

Experiments conducted to study photoluminescence of materials in the far-infrared region, utilizing a photo-resistor of PbS as collector of radiation. 2 ref.

8773* Electron-Optic Method of Reflection of Objects With Magnetic Inhomogeneities. (Russian.) G. V. Spivak, N. G. Kanavina, I. N. Chernyshev, and I. S. Sbitnikova. *Doklady Akademii Nauk SSSR,* v. 92, no. 3, Sept. 21, 1953, p. 541-543 + 1 plate.

Method of observing objects containing magnetic inhomogeneities located on the cathode of an electron-emission microscope. Secondary-electron-emission type of microscope was studied particularly. Diagram, photographs. 6 ref.

8774* Optical Method of Determining the Concentration of Unexcited Atoms and Molecules. (Russian.) A. M. Shukhtin. *Doklady Akademii Nauk SSSR,* v. 92, no. 3, Sept. 21, 1953, p. 553-555.

Method whereby two branches of a Rozhdestvenskii interferometer contain layers of same material but of different thicknesses, so that interference bands near absorption lines are straightened out because of difference in optical path lengths. 3 ref.

8775* The Interaction of Gravitation With Vacuum of Particles. (Russian.) D. Ivanenko and A. Brodskii. *Doklady Akademii Nauk SSSR,* v. 92, no. 4, Oct. 1, 1953, p. 731-734.

Investigates scalar or pseudoscaler particles (mesons). Expression permits analyzing different effects connected with polarization of vacuum of particles by a gravitation field. 4 ref.

8776* Electron-Avalanche Processes at Ultra-High Energies. (Russian.) L. Landau and I. Pomeranchuk. *Doklady Akademii Nauk SSSR,* v. 92, no. 4, Oct. 1, 1953, p. 735-738.

Investigates rational processes under conditions in which theory developed by Bethe and Heitler, of "braking" radiation of electrons and positrons and of formation of electron-positron pairs by γ-quanta, is incorrect. 2 ref.

8777* Spectrophotometric Methods of Determining the Intensity, Shape, and Width of the Infrared-Absorption Bands of Liquid. (Russian.) A. V. Iogansen. *Doklady Akademii Nauk SSSR,* v. 92, no. 5, Oct. 11, 1953, p. 919-922.

Investigates particular cases of determining true spectral characteristics of a substance from observed values by utilizing appropriately calculated corrections. Graphs, table. 1 ref.

8778* Formulation of Rules of the Filling of Electron Levels. (Russian.) V. M. Klechkovskii. *Doklady Akademii Nauk SSSR,* v. 92, no. 5, Oct. 11, 1953, p. 923-926.

Method determines location within periodic system in which filling of quantum levels with a given value of orbital quantum number is initiated. Table. 5 ref.

8779* Surface Resonance on a Reflection Grating. (Russian.) L. N. Deriugin. *Doklady Akademii Nauk SSSR,* v. 94, no. 2, Jan. 11, 1954, p. 203-206.

Investigation during diffraction of a normally incident plane wave on a reflection grating with narrow grooves. Compares such diffraction with diffraction far from resonance. Graph. 2 ref.

8780 Penetration of an Electromagnetic Wave Into a Ferromagnetic Material. A. Papoulis. *Journal of Applied Physics,* v. 25, Feb. 1954, p. 169-176.

Approximate solution for case of a rectangular hysteresis loop material. Oscillograms, table, diagrams, graphs.

8781 Current Noise in Thermistor Bolometer Flakes. James J. Brophy. *Journal of Applied Physics,* v. 25, Feb. 1954, p. 222-224.

Characteristics of additional electrical noise, generated by Fe_2O_3 thermistor bolometer flakes due to direct current passing through the units. Graphs, table, diagram. 7 ref.

8782 The Quantum Mechanics of Collisions Between Diatomic Molecules. C. F. Curtiss. *Journal of Chemical Physics,* v. 21, Nov. 1953, p. 2045-2050.

Explicit expressions for angular transition probabilities are

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obtained. Solution of coupled differential equations by a perturbation method. 4 ref.

8783 Evaluation of Some Electron Repulsion Integrals Needed in Molecular Quantum Mechanics. II. Use of the Neumann Expansion in Evaluation of Two Electron Three-Center Repulsion Integrals. Roland S. Barker and Henry Eyring. *Journal of Chemical Physics,* v. 22, Jan. 1954, p. 114-119.

Mathematical discussion. Tables. 13 ref.

8784 Steady-State Diffusion Into a Streaming Sphere at Low Reynolds Number. H. L. Frisch. *Journal of Chemical Physics,* v. 22, Jan. 1954, p. 123-125.

Solution of Smoluchowski equation, describing diffusion into a spherical sink streaming with constant velocity relative to the fluid, is obtained as a power series in a parameter which is directly proportional to Reynolds number of the flow. 10 ref.

8785 Mass Spectrometric Study of the Molecular Sublimation of Graphite. Richard E. Honig. *Journal of Chemical Physics,* v. 22, Jan. 1954, p. 126-131.

Emission of neutral and charged C molecules from spectroscopically pure graphite was studied by rate of vaporization experiments in a 180° mass spectrometer. Tables, graphs. 20 ref.

8786* Emission Spectra of Electroluminescent Products Excited by Multiple Activators. (French.) Georges Destriau. *Journal de physique et le radium,* v. 15, no. 1, Jan. 1954, p. 13-15.

Presence of one of the activators was noted in each spectral band during electroluminescent emission. Spectrographs, oscillographs. 7 ref.

8787* Radiowave Spectrum and Structure of Solids. III. Preliminary Investigations of Non Stoechiometric Compounds. Uranium Oxides. (French.) M. Freymann, S. Langevin, M. T. Rolland-Bernard, P. Perio, and R. Kleinbreger. *Journal de physique et le radium,* v. 15, no. 2, Feb. 1954, p. 82-91.

Absorption and dielectric constant as function of temperature and frequency. Tables, graphs. 28 ref.

8788* The Use of Models for Study of Plastic-Elastic Behaviour. (German.) Ernst Jenckel. *Kolloid-Zeitschrift,* v. 134, no. 1, Dec. 1953, p. 47-59; disc., p. 59-64.

Shows use of Maxwells' and Voigts' models and combinations of models as an aid in studying substances under different conditions. Diagrams, graphs. 11 ref.

8789* A Study of the $F \rightarrow Z_1$ Conversion in *KCl* Crystals With Divalent Impurities. (English.) P. Camagni and G. Chiarotti. *Nuovo cimento,* v. 11, ser. 9, no. 1, Jan. 1, 1954, p. 1-10.

Quantum yield of conversion during exposure to *F* light. Diagrams, graphs. 19 ref.

8790* A Sound-Wave Description of Fermion Assemblies. (English.) M. R. Schafroth. *Nuovo cimento,* v. 11, ser. 9, no. 1, Jan. 1, 1954, p. 53-72.

Thermodynamic functions are calculated. An application to problem of density fluctuations is sketeched. 10 ref.

8791* On the Nature of the *K-Meson*. (English.) N. Dallaporta. *Nuovo cimento,* v. 11, ser. 9, no. 1, Jan. 1, 1954, p. 82-87.

Obtained values are in rather good agreement with experimental data. 8 ref.

8792 The Index of Refraction of Germanium Measured by an Interference Method. D. H. Rank, H. E. Bennett, and D. C. Cronemeyer. *Optical Society of America, Journal,* v. 44, Jan. 1954, p. 13-16.

High-precision determination of index of refraction in 2.0-2.4μ region. Tables, diagrams. 6 ref.

8793 On the Absorption Law for Samples of Nonuniform Concentration With Special Reference to the Spectroscopy of Irradiated Glasses. Ian G. Ross. *Optical Society of America, Journal,* v. 44, Jan. 1954, p. 40-44.

Results for light absorption measurements in which number of absorbing molecules encountered is not constant. Graphs, diagrams. 3 ref.

8794 Effect of Color Temperature on Brightness. R. E. Harrington. *Optical Society of America, Journal,* v. 44, Feb. 1954, p. 113-116.

Two screens viewed side by side were illuminated by radiation approximating those of blackbodies of different color temperatures and matched in brightness at photopic levels. Tables, graphs, diagram. 8 ref.

8795 Excitation of Zinc Oxide Phosphors by Low-Energy Electrons. Ross E. Shrader and S. F. Kaisel. *Optical Society of America, Journal,* v. 44, Feb. 1954, p. 135-139.

Phenomenon of excitation by electrons when applied voltages are equal to or less than equivalent of observed photons was investigated. Graphs, diagrams. 16 ref.

8796 A Variation Principle for Electronic Wave Functions in Crystals. D. P. Jenkins and L. Pincherle. *Philosophical Magazine,* v. 45, 7th ser., no. 360, Jan. 1954, p. 93-99.

Energy levels of electrons in polyatomic lattices. Tables. 5 ref.

8797 Quantization of a Nonlinear Field Theory. Herbert B. Rosenstock. *Physical Review,* v. 93, ser. 2, Jan. 15, 1954, p. 331-333.

A quantization procedure, involving expansion of the field in a space lattice of classical particles, is suggested for a field theory in which classical particles appear as small regions in which the field is intense. Approximate energy eigen values are calculated for certain values of parameters involved. 5 ref.

8798 Electroluminescence in Thin Films of ZnS: Mn. R. E. Halsted and L. R. Koller. *Physical Review,* v. 93, ser. 2, Jan. 15, 1954, p. 349-350.

Preliminary data on films of ZnS: Mn (approximately 0.5% Mn) reveal some interesting variations from previously reported electroluminescent behavior. Graphs. 8 ref.

8799 Elastic Scattering of Intermediate-Energy Alpha Particles by Gold. George W. Farwell and Harvey E. Wegner. *Physical Review,* v. 93, ser. 2, Jan. 15, 1954, p. 356-357.

Includes graph. 3 ref.

8800 Magnetic Resonance Phenomena in Ferrites. Fielding Brown and David Park. *Physical Review,* v. 93, ser. 2, Feb. 1, 1954, p. 381-384.

Includes graphs. 19 ref.

8801 One-to-Two Millimeter Wave Spectroscopy. IV. Experimental Methods and Results for OCS, CH_3F, and H_2O. William C. King and Walter Gordy. *Physical Review,* v. 93, ser. 2, Feb. 1, 1954, p. 407-412.

Details of harmonic generator and detector which made possible precision spectroscopy in one-to-two mm. wave region. Tables, diagrams, oscillograms, photographs. 10 ref.

8802 Spectrum of DBr in the One-Millimeter Wave Region. Walter Gordy and Charles A. Burrus. *Physical Review,* v. 93, ser. 2, Feb. 1, 1954, p. 419-420.

Measurements on the $0 \rightarrow 1$ transition of DBr at 1.18 mm. wave length. Tables, oscillogram. 6 ref.

8803 Infrared Lattice Absorption Bands in Germanium, Silicon, and Diamond. R. J. Collins and H. Y. Fan. *Physical Review,* v. 93, ser. 2, Feb. 15, 1954, p. 674-678.

Absorption was found to be insensitive to lattice imperfections due to impurities and disorders produced by nucleon irradiation. Varies with temperature in same way as calculated mean-square displacement of atoms. Graphs, table. 15 ref.

8804 A Modified Form of Heisenberg's Theory of Ferromagnetism. R. H. Tredgold. *Physical Society, Proceedings,* v. 67, no. 410A, Feb. 1954, p. 148-152.

Theory of ferromagnetism is extended to include exchange interactions between atoms other than nearest neighbors. Calculation is carried through third approximation and general

expression for susceptibility above Curie point is obtained. Graph. 8 ref.

8805 Friction of an Elastic Solid. A. S. Lodge and H. G. Howell. *Physical Society, Proceedings*, v. 67, no. 410B, Feb. 1954, p. 89-97.

Study in terms of elastic asperity theory of relation $F=\alpha R^n$. 10 ref.

8806 Excitation Conditions for the Infra-Red Auroral Bands of Ionized Nitrogen. D. T. Stewart, P. W. F. Gribbon, and K. G. Emeléus. *Physical Society, Proceedings*, v. 67, no. 410A, Feb. 1954, p. 188-189.

Mechanism of production of bands from a number of sources, particularly some employing pure N. 8 ref.

8807* The Raman and Infrared Absorpiton Spectrum of Selenophene. (English.) H. Gerding, G. Milazzo, and H. H. K. Rossmark. *Recueil des travaux chimiques des Pays-Bas*, v. 72, no. 11, Nov. 1953, p. 957-962.

Raman frequencies of liquid selenophene. Infra-red absorption bands of liquid selenophene were determined in region 1600–670 cm^{-1}. Tables. 5 ref.

8808 Solid State Electronics. II. K. K. Darrow. *Research*, v. 7, Feb. 1954, p. 46-53.

Includes graphs, diagrams.

8809* The Application of Fourier Transforms in Physical Problems. W. H. Watson. *Royal Society of Canada, Transactions*, v. 47, ser. 3, sec. 3, June 1953, p. 37-46.

Mathematical discussion on operational use of integral transforms. Graph. 8 ref.

8810* On the Order of Convergence of Solutions of a Difference Equation to a Solution of the Diffusion Equation. M. L. Juncosa and D. M. Young. *Society for Industrial and Applied Mathematics, Journal*, v. 1, Dec. 1953, p. 111-135.

Partial differential equation appearing in problems in heat conduction, Brownian motion, genetics, transistors, and other problems of diffusion. 25 ref.

8811 Flight Investigation at Large Angles of Attack of the Static-Pressure Errors of a Service Pitot-Static Tube Having a Modified Orifice Configuration. William Gracey and Elwood F. Scheithauer. *U. S. National Advisory Committee for Aeronautics, Technical Note* 3159, Feb. 1954, 25 p. (TL570 Un3t)

Results of flight tests of tubes with original and modified orfice configuration. Graphs, photographs, diagrams. 5 ref.

8812* Passage of Ultrasound Through Porous Bodies in Liquids. (German.) Gerhard Schmid and Heinrich Knapp. *Zeitschrift für angewandte Physik*, v. 5, no. 12, Nov. 27, 1953, p. 463-472.

Importance to ultrasound therapy; underwater sound technology; break-up of macromolecules with ultrasound; and washing and drying of textiles with sonic frequencies. Graphs, diagrams. 9 ref.

8813* Motion of Charge Carriers in Non-Homogeneous Fields. (German.) W. Bez and K. H. Höcker. *Zeitschrift für Naturforschung*, v. 9a, no. 1, Jan. 1954, p. 64-66.

Two differential equations which permit calculation of speed of charge carriers in field direction and energy contained in inordinate motion.

Books and Miscellaneous Publications

8814 Kernel Functions and Elliptic Differential Equations on Mathematical Physics. Stefan Bergman and M. Schiffer. 432 p. 1953. Academic Press, New York. (QA331 B45k)

Gives a survey of boundary value problems occurring in some branches of theoretical physics and exact mathematical formulation of problems and methods involved.

8815 Methods of Mathematical Physics. R. Courant and D. Hilbert, v. I. 561 p. 1953. Interscience Publishers, Inc., N. Y. (Translated and revised from the original German by Peter Ceike, Ernest Courant, and Anneli Lax.) (QA303 C83mtr)

Chapters cover algebra of linear transformations and quadratic forms; series of expansions of arbitrary functions; linear integral equations; the calculus of variations; vibration and eigen value problems; application of the calculus of variations to eigen value problems; and special functions defined by eigen value problems.

8816 Singular Integral Equations. N. I. Mushelishvili. 2nd Ed. 1946. 447 p. 1953. P. Noordhoff N. V., Groningen, Holland. (Translated from the Russian by J. R. M. Badok.) (QA431 M97s2tr)

Systemmatically acquaints the reader with mathematical apparatus of Cauchy type integrals and singular integral equations. A considerable part is devoted to application to solution of numerous problems of potential theory, theory of elasticity, and other sections of mathematical physics.

8817 Associated Measurements. M. H. Quenouille. 242 p. 1952. Academic Press, Inc., New York. (QA276 Q34a)

Sections cover graphical and numerical analysis; rapid estimation and analysis; and analytical complications. Includes an extensive bibliography and an appendix of statistical tables.

See also:
7396 (turbulence as a source of sound)
7994 (fundamentals of electronic motion)
8036 (compression of H_2O in a shock wave)
8681 (X-ray focal spot measurement)

PLASTICS

8818* 1953 Annual Convention — Textile Auxiliaries Group. Polymers for the Textile Industry. Leonard Shapiro. *American Dyestuff Reporter*, v. 43, Mar. 1, 1954, p. P132-P140.

Emulsion polymers and copolymers, available in wide range of compositions, possesses varied physical and chemical properties. Graphs, table. 10 ref.

8819* Plastics in Chemical Warfare. Abe J. Goldsmith. *Armed Forces Chemical Journal*, v. 8, Jan.-Feb. 1954, p. 20, 34, 40.

Includes photographs.

8820* Three Years' Outdoor Weather Aging of Plastics Under Various Climatological Conditions. S. E. Yustein, R. R. Winans, and H. J. Stark. *ASTM Bulletin*, 1954, no. 196, p. 29-38; disc., p. 28-39.

Materials investigated include clear transparent sheet plastics, laminated materials, and molded terminal bars. Tables, graphs, photographs. 2 ref.

8821* High Vacuum Applications of Polythene. J. F. Duncan and D. T. Warren. *British Journal of Applied Physics*, v. 5, Feb. 1954, p. 66-69.

Fabrication of polythene vessels, valves, taps, fine control valves, manometers is described, with use of polythene in jointing glass, metal, alumina and other ceramics to high vacuum lines. Diagrams, photographs. 2 ref.

8822 Molecular Weight and Polymer Properties. D. Cleverdan and J. J. Millane. *British Plastics*, v. 27, Feb. 1954, p. 56-61, 68.

Includes tables, graphs. 38 ref.

8823 Acrylates: Their Manufacture and Uses. E. H. Riddle. *Canadian Chemical Processing*, v. 38, Feb. 1954, p. 44, 46, 48, 50.

New process for synethesis of acrylates involves acetylene and is petrochemically based.

8824* Some Sterochemical Aspects of Polyenes. (English.) L. Zechmeister. *Experientia*, v. 10, no. 1, 1954, p. 1-11.

Shows that class of open-chain polyenes constitutes an exceptionally good example of influence of molecular shape on characteristics of a compound. Diagrams, graphs. 69 ref.

8825 Photosensitization of Polymerization Reactions. B. R. Chinmayanandam and H. W. Melville. *Faraday Society, Transactions*, v. 50, Jan. 1954, p. 73-82.

Absolute rate coefficients for benzoin-sensitized photo-polymerization of methyl methacrylate employing illumination of wave length 3600 A were determined. Tables, graphs. 23 ref.

Physics

8826* An Operating Man Looks at Plastic Tubing for Gas Mains. C. H. Webber. *Gas*, v. 30, Feb. 1954, p. 44-46.

Requisites of plastic tubing for use in mains. Photographs.

8827* Injection Molding of Elastomeric Vinyls. I. Frank A. Martin. *India Rubber World*, v. 129, Feb. 1954, p. 624-627.

Properties of PVC; molding methods and problems; thermal stability and conductivity; and better plasticizing action. Diagrams, photograph. (To be concluded.)

8828 Color Uniformity in Low Pressure Laminates. Paul Fram, Thomas F. Dunne, and Fred Leonard. *Industrial and Engineering Chemistry*, v. 46, Feb. 1954, p. 393-396.

Investigation to determine factors responsible for color variations and to establish satisfactory color shade guides in laminated prostheses for the artificial limb manufacturing industry. Tables, graphs. 11 ref.

8829 A Study of Oil-Polymer Masterbatches. W. K. Taft, June Duke, R. W. Laundrie, A. D. Synder, D. C. Prem, and Howard Mooney. *Industrial and Engineering Chemistry*, v. 46, Feb. 1954, p. 396-412.

Includes graphs, tables, diagrams. 10 ref.

8830 Relation Between Stress-Relaxation Studies and Dynamic Properties of Polyisobutylene. E. Catsiff and A. V. Tobolsky. *Journal of Applied Physics*, v. 25, Feb. 1954, p. 145-152.

Interrelations between experimental values are explored, using wedge-box idealized distribution functions as well as other recently developed mathematical methods. Tables, graphs. 23 ref.

8831 Magnetic Study on High Polymers. I. Diamagnetic Anisotropy of Natural Rubber. Akira Isihara, Hazime Kusumoto, Hiroshi Nagano, and Keichi Oshima. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 1909-1911.

Anisotropy was measured by varying time and temperature of vulcanization and found to decrease with time. Graphs, table, diagram. 7 ref.

8832 Mean Dimensions of Rubber-Like Polymer Molecules. Frederick T. Wall. *Journal of Chemical Physics*, v. 21, Nov. 1953, p. 1914-1919.

Mean square end-to-end separtions of coiling type polymer molecules were calculated by two different approximate methods, taking into account effect of excluded volumes. Diagrams. 7 ref.

8833* Size and Shape of Droplets of Demixing Polymer Solutions in a Field of Flow. A. Silberberg and W. Kuhn. *Journal of Polymer Science*, v. 13, Feb. 1954, p. 21-42.

Includes diagrams, photographs, table, graphs. 9 ref.

8834* The Half-Life of the Styrene Free Radical. I. Photopolymerization in a Free Falling Stream. George Goldfinger and Carl Heffelfinger. *Journal of Polymer Science*, v. 13, Feb. 1954, p. 123-130.

Principle of Paneth and Hofeditz method of studying gaseous free radicals was employed for chain reactions in liquid monomers. Diagram, graph, table. 6 ref.

8835* Choice of Solvent for the Viscometric Determination of Molecular Weights of High Polymers. L. H. Cragg, R. H. Sones, and T. E. Dumitru. *Journal of Polymer Science*, v. 13, Feb. 1954, p. 167-174.

Includes graphs. 32 ref.

8836* Elastic Properties of Polyvinyl Chloride Gels. A. T. Walter. *Journal of Polymer Science*, v. 13, Mar. 1954, p. 207-228.

Equipment, techniques, and results of experimental studies. Tables, graphs, photograph. 21 ref.

8837* Effect of Boundary Planes on Polymerization. (German.) Joh. F. Ehlers. *Kolloid-Zeitschrift*, v. 133, nos. 2-3, Nov. 1953, p. 112-117.

Experiments of methacrylic acid methyl ester over equal amounts of water reveal reactions and degrees of polymerization. Graphs. 6 ref.

8838* Acrylo-Nitrile as a Co-Monomer in Hard Acrylic Plastics. (German.) Klaus Tessmar. *Kunststoffe*, v. 43, no. 12, Dec. 1953, p. 496-502.

Chemical and physical properties. Photographs, tables, graphs. 9 ref.

8839* Extruders. (German.) Hans Beck. *Kunststoffe*, v. 43, no. 12, Dec. 1953, p. 530-539.

Theory and performance of extruders regulating quality and production of plastics. Diagrams, graphs, table, photographs. 14 ref.

8840* The Printing of Thermoplastics. (German.) Walther Kühn. *Kunststoffe*, v. 43, no. 12, Dec. 1953, p. 544-546.

Printing processes and machines. Photographs.

8841* The Technique of Injection Molding Thermoplastics. (German.) Hans Volland. *Kunststoffe*, v. 43, no. 12, Dec. 1953, p. 552-558.

Production of articles with low stress and high shape retention. Diagrams.

8842* Flame-Spraying of Plastics and Related Methods. (German.) E. Gemmer. *Kunststoffe*, v. 43, no. 12, Dec. 1953, p. 564-568.

Advantages, disadvantages, and application. Photographs.

8843* Alpha-Chlorocrystals. (German.) Klaus Tessmar. *Kunststoffe*, v. 44, no. 1, Jan. 1954, p. 9-10.

Preparation of new plastics through substitution and copolymerization. Materials show improved mechanical, optical, and thermal properties. Tables, graph. 24 ref.

8844* The Crushing of Plastics. (German.) Hans Rumpf. *Kunststoffe*, v. 44, no. 2, Feb. 1954, p. 43-48.

Theoretical bases of crushing processes, such as rupture process in an individual body, principles of brittle fracture, and determination of energy in crushing of individual grains. Fundamentals of crushing of plastics by machine. Tables, diagram. 8 ref.

8845* Rupture Processes in Plastics. (German.) H. Schardin. *Kunststoffe*, v. 44, no. 2, Feb. 1954, p. 48-55.

Tensile tests on plastics with high frequency cinematography. Investigations complemented by electrical measurements of rupture rates, an analysis of rupture surface, and time measurements by ultrasound. Micrographs, graphs, diagrams. 7 ref.

8846* Extrusion Pressing of Polystyrol. II. Method of Processing. (German.) *Kunststoffe*, v. 44, no. 2, Feb. 1954, p. 77-79.

Design of discharge nozzles and other parts of machinery used for extrusion pressing. Measures for cooling material and considerations for design. Diagrams.

8847 Designing Fabricated Nylon Parts. R. B. Zimmerli. *Machine Design*, v. 26, Mar. 1954, p. 153-159.

Design flexibility plus advantageous combination of properties attained by machining or stamping parts from stock nylon shapes. Photographs, diagram, graphs, table.

8847a* Chemistry of the Unsaturated Polyester Alkyd Resins. II. (Hungarian.) Ibolya Szmercsányi Vancsóné. *Magyar Kémikusok Lapja*, v. 9, no. 1, Jan. 5, 1954, p. 26-30.

Polymerization and the role of peroxides, promoters, and inhibitors. Results of experiments on polymerization done at the Hungarian Research Institute of the Plastics Industry. Tables, graphs. 9 ref.

8848* Molecular Weight and Viscosity Number of Polystyrene of Average Molecular Size. (German.) W. Kern and M. Rugenstein. *Makromolekulare Chemie*, v. 11, no. 1, Oct. 1953, p. 1-9.

Viscosimetric and osmotic measurements on a polymerhomologous series of fractional polystyrenes. Tables, graphs. 14 ref.

8849 A New Fire-Resistant Polyester—New Materials Preview. *Materials & Methods*, v. 39, Feb. 1954, p. 98-101.

Service and fabrication properties are at least equal to those of conventional polyesters. Photographs, tables.

8850* Vacuum Formed Plastics. *Modern Packaging*, v. 27, Feb. 1954, p. 108-113, 198, 200, 202-204, 206.

New techniques in production and use are opening up vast new low-cost fields for packaging. Photographs.

8851 Hardening Speed of Phenoplasts. H. L. Bender. *Modern Plastics*, v. 31, Mar. 1954, p. 115-116, 118, 200.

Techniques of process of hardening of phenolic resins using hexamethylenetetramines. Tables, graph. 7 ref.

8852* Compatibility of Polymeric Materials. Walter J. Hanau. *Paint and Varnish Production*, v. 44, Mar. 1954, p. 31-33.

Problems in blending. 6 ref.

8853 The Dynamic Mechanical Properties of Some Organic Glasses. J. J. Benbow. *Physical Society, Proceedings*, v. 67, no. 410B, Feb. 1954, p. 120-130.

Dynamic shear properties of 2'-hydroxy-2:4:4:6:5'-pentamethylflavan and glycerol sextol (cyclo-hexanol) phthalate, were studied at frequencies between 10^{-4} and 10^{4} c/s. Graphs, diagram. 25 ref.

8854 Polyvinyl Chloride Extrusions. E. E. Halls. *Plastics*, v. 19, Feb. 1954, p. 61-63.

Properties, application, and test procedures. Tables.

8855* Gaskets. Steve Elonka. *Power*, v. 98, Mar. 1954, p. 105-124.

Various types of sealing materials and methods. Photographs, drawings, table, graphs.

8856 Self-Branching in the Polymerization of Vinyl Acetate. J. C. Bevington, G. M. Guzman, and H. W. Melville. *Royal Society, Proceedings*, v. 221, ser. A, Feb. 9, 1954, p. 437-452.

Kinetics of process known as "transfer to polymer" and extent to which synthetic polymers are branched. Graphs, tables, diagrams. 14 ref.

8857 Self-Branching in the Polymerization of Styrene. J. C. Bevington, G. M. Guzman, and H. W. Melville. *Royal Society, Proceedings*, v. 221, ser. A, Feb. 9, 1954, p. 453-462.

Monomeric styrene labelled with ^{14}C was perpared and used to study branching of styrene. Graphs, tables. 9 ref.

8858 The Cold Drawing of High Polymers. I. Marshall and A. B. Thompson. *Royal Society, Proceedings*, v. 221, ser. A, Feb. 9, 1954, p. 541-557.

Draw ratio across the shoulders is not constant for polymer, but is found to depend on temperature, speed of stretching, initial specimen cross-section, and birefringence. Graphs, diagrams, tables. 22 ref.

8859 Use and Processing of Celluloid. (Swedish.) R. P. Sondermann. *Svenska Plast Föreningen Tekniska Meddelanden*, v. 8, no. 39, Oct. 1953, 8 p. (TP986 Sv25t)

Various uses of celluloid; proper and improper methods of processing.

8860 Problem of Raw Material in the Synthesis of Plastics. (Swedish.) M. Meis. *Svenska Plast Föreningen Tekniska Meddelanden*, v. 8, no. 41, Nov. 1953, 6 p. (TP986 Sv25t)

Sweden's difficulty in securing necessary raw materials. Includes structural formulas of different plastics. Diagrams, chart.

8861 The Status of the Technique of Welding Hard and Soft Thermoplastics. (Swedish.) H. Peukert. *Svenska Plast Föreningen Tekniska Meddelanden*, v. 8, no. 47, Dec. 1953, 4 p. (TP986 Sv25t)

Research; basic features; advantages and disadvantages of different welding methods; and equipment used in plastics processing industry. Table.

8862* Plastics and Tissue. (German.) J. G. J. Metzner. *Werkstoffe und Korrosion*, v. 4, no. 12, Dec. 1954, p. 442-446.

Successful use of different synthetic resins for surgical and dental purposes. Eliminated undesirable physiological effects of galvanic action of metals formerly used for this purpose. Photographs.

8863 Cellular Polyethylene. W. T. Higgins. *Wire and Wire Products*, v. 29, Mar. 1954, p. 287, 290-291, 339.

Dielectric properties, extrusion, moisture considerations, and applications. Graphs, micrograph, table.

8864* Sensitized Photopolymerization of Styrene. I. Rapid Method of Selecting Pigments and Investigation of Several Pigments. (German.) Kurt Ueberreiter and Günter Sorge. *Zeitschrift für Elektrochemie*, v. 57, no. 9, Dec. 1953, p. 795-800.

Rapid analysis experiments with cold white light. Graphs, tables. 5 ref.

8865* Thermodynamic Analysis of Polystyrene Solutions in Different Solvents. (German.) G. V. Schulz and H. Hellfritz. *Zeitschrift für Elektrochemie*, v. 57, no. 9, Dec. 1953, p. 835-841.

Measurements of effect of concentration on osmotic pressure and computation of mol. wt. and viral coefficient. Tables, graph. 26 ref.

Books and Miscellaneous Publications

8866 Principles of Polymer Chemistry. Paul J. Flory. 672 p. 1953. Cornell University Press. Ithaca. (QP281.P6 F66p)

Principle of polymers; well defined generalizations; and experimental results illustrate and develop basis for the principles.

See also:
7659 (ionic polymerization)
7686 (snythesis of macromolecules)
7687 (adsorptivity of water-soluble polymer compounds)
7854 (variation in dielectric constant of several plastics)
7910 (plastics in electroplating plants)

POLLUTION AND WASTES

8867* Case Histories of Stream Pollution. I. Textile Effluent and a Sewage Plant. John B. Dick. **II. History of Operations of Textile-Sewage Plants in Connecticut.** Willis J. Snow. **III. History of a Plant for Treatment of Textile Sewage.** A. N. Henschel. *American Dyestuff Reporter*, v. 43, Feb. 15, 1954, p. P112-P115.

Includes tables.

8868* AATCC Committee on Stream Pollution—A Comparison of the Oxygen Consumed From Permanganate and B O D Tests in the Study of Textile Wastes. Rhode Island Section Subcommittee on Stream Pollution. *American Dyestuff Reporter*, v. 43, Mar. 1, 1954, p. P130-P131.

Includes tables. 7 ref.

8869* Radium Content of Public Water Supplies. John B. Hursh. *American Water Works Association, Journal*, v. 46, Jan. 1954, p. 43-54.

Concentration of Ra^{226} was measured in 41 raw and tap water samples. Measurements serve to supply information on concentration of an important α-emitting natural constituent of raw water sources. Provides basis for comparison with future measurements investigating possible contamination by radioactive wastes. Tables, diagrams. 7 ref.

8870* Reduction of Radioactivity in Water. Sol Goodgal, Earnest F. Gloyna, and Dayton E. Carritt. *American Water Works Association, Journal*, v. 46, Jan. 1954, p. 66-78.

Outlines mechanisms by which dissolved substances can be removed from solution; indicates results of applying commonly used flocculation procedures for removal of mixed fission products from raw river water; and describes application of basic chemical and physic chemical principles to removal of strontium. Graphs, tables. 9 ref.

8871* Underground Movement of Bacterial and Chemical Pollutants. R. G. Butler, G. T. Orlob, and P. H. McGauhey. *American Water Works Association, Journal*, v. 46, Feb. 1954, p. 97-111.

Proposed reclamation methods; field studies; and pollution travel with ground water. Tables, graphs. 29 ref.

8872* Aromatic Hydrocarbons. I. Presence in the Los Angeles Atmospheres and the Carcinogenicity of Atmos-

Pollution and Wastes

pheric Extracts. Paul Kotin, Hans L. Falk, Paul Mader, and Marilyn Thomas. **II. Presence in the Particulate Phase of Gasoline-Engine Exhausts and the Carcinogenicity of Exhaust Extracts.** Paul Kotin, Hans L. Falk, and Marilyn Thomas. *Archives of Industrial Hygiene and Occupational Medicine*, v. 9, Feb. 1954, p. 153-177.

Systematic search for sources of carcinogenic air pollutants, undertaken with the view of identifying origin and determining ultimate fate following emission into the air. Graphs, tables, photographs, photomicrographs. 31 ref.

8873 Smokeless Burning of Waste Process Gases. R. D. Reed. *ASME, Transactions*, v. 76, Feb. 1954, p. 251-253.

Difficulties of and methods for achieving blue-flame burning which is virtually smokeless.

8874* Non-Metallic Materials of Construction for Handling Radioactive Wastes. L. H. Griffiths. *Atomics (British)*, v. 5, Mar. 1954, p. 69-72.

Value of conventional materials of construction used in normal chemical effluent work. Photographs.

8874a* The Hersey Reserve-Jet Dust Filter. Knowlton J. Caplan. *Chemical Engineering Costs Quarterly*, v. 4, Jan. 1954, p. 9-15.

Operation costs of commercial equipment. Diagram, photographs, graphs, tables.

8875* Electric Gas Cleaning. (Hungarian.) Károly Horváth. *Elektrotechnika*, v. 47, no. 1, Jan. 1954, p. 21-28.

Principles of operation and construction; dust cleaners for powder stations; coal dust separators; generator gas cleaners; and cleaning plants for cement factories and metallurgical works. Diagrams, graphs, tables.

8876* Ultrasonic Flue Dust Elimination. H. Manley. *Engineer*, v. 197, Feb. 19, 1954, p. 291.

Use of siren to get high intensity and power levels for particle elimination. Photograph, diagram, graph. 10 ref.

8877* The Grading of Fly Ash. D. H. Lucas. *Engineering*, v. 177, Feb. 26, 1954, p. 272-273.

Apparatus for terminal-velocity grading of fly ash. A single sample of 50 to 100 mg. can be completely graded in one hour. Micrographs, graph, diagrams.

8878 Continuous Disposal of Fluorine. S. H. Smiley and C. R. Schmitt. *Industrial and Engineering Chemistry*, v. 46, Feb. 1954, p. 244-247.

Method utilizes reactions with superheated steam. Diagrams, tables, graphs. 19 ref.

8879 Waste Disposal in the Petroleum Industry. Introduction. R. N. Giles. *Industrial and Engineering Chemistry*, v. 46, Feb. 1954, p. 283-333.

Includes "Taste- and Odor-Producing Components in Effluents", C. C. Ruchhoft, F. M. Middleton, Harry Braus, and A. A. Rosen; "Physical and Chemical Characteristics of Waste Waters", Frank J. Coogan and E. B. Paille; "Biological Growths in Petroleum Refinery Waste Waters", Edwin S. Crosby, Willem Rudolfs, and Hovhaness Heukelekian; "Treatment of Refinery Emulsions and Chemical Wastes", Cecil Phillips, Jr.; "Application of Air Flotation to Refinery Waste Waters", Gerard A. Rohlich; "Superactivated Sludge Process", E. R. Strong and Richard Hatfield; "Biological Oxidation of Oil-Containing Waste Water", R. J. Austin, W. F. Meehan, and J. D. Stockham; "Reclamation of Refinery Effluents", C. D. Eaton, R. R. Evans, and E. G. Kominek; "Toxicity of Various Refinery Materials to Fresh Water Fish", Harry Turnbull, J. G. DeMann, and R. F. Weston. Photographs, tables, diagrams, infra-red spectrograms, graphs. 73 ref.

8880 Atmospheric Pollution. Louis C. McCabe. *Industrial and Engineering Chemistry*, v. 46, Feb. 1954, p. 95A-96A, 98A.

Smokescope uses principles of Nyder gun sight to over-come difficulties experienced with Ringelmann chart. Diagrams, photograph, table.

8881 Industrial Wastes. Sheppard T. Powell. *Industrial and Engineering Chemistry*, v. 46, Mar. 1954, p. 112A-113A.

Power generating stations can develop stream pollution problems unless disposal methods are planned. Graphs, table.

8882* The Recovery and Use of Rejected (Waste) Heat in Industry. S. J. Eardley. *Institute of Fuel, Journal*, v. 27, Feb. 1954, p. 67-78.

Reviews industrial heat requirements. Points out situations where use of waste heat can result in lower costs and more efficient operation. Tables, diagrams. 5 ref.

8883 Separation Plant Removes Sludge From Waste Water. J. E. Culleton. *Iron Age*, v. 173, Feb. 11, 1954, p. 131-133.

Equipment and operating characteristics. Photograph, diagrams.

8884 Dust Control. *Iron & Steel*, v. 27, Feb. 1954, p. 42.

BCIRA model extractor now available, its design, construction, and applications. Drawing.

8885* The Purification of Cannery Waste Waters in Biological Filters. Denis Dickinson. *Journal of the Science of Food and Agriculture*, v. 5, Feb. 1954, p. 94-99.

Summarizes experience gained over a period of several years in design and operation of a biological filtration plant for purification of wastes from a medium-sized fruit and vegetable cannery. Graphs, diagrams. 6 ref.

8886* Acid Mine Drainage. I. The Problem. II. Sources. S. A. Braley. *Mechanization*, v. 18, Jan. p. 87-89; Feb. 1954, p. 113-115.

Problems of preventing stream pollution. Explains how chemical reactions occur more rapidly in mines than under laboratory conditions. Photographs. 5 ref.

8887* Ably Engineered Water Services Pay Big Dividends. Ross Nebolsine, Angus D. Henderson, and Hugh MacDougall. *Power*, v. 98, Mar. 1954, p. 69-73.

Water-supply and wastes-treatment facilities at U.S. Steel's Fairless Works. Photograph, diagrams.

8888* Power's MicroRingelmann: A New Aid to Smoke Inspectors. *Power*, v. 98, Mar. 1954, p. 90-93.

A new smoke chart usable at arms length. Charts, photographs.

8889* Sewage Effluent Disposal Through Crop Irrigation. C. D. Henry, R. E. Moldenhauer, L. E. Engelbert, and E. Truog. *Sewage and Industrial Wastes*, v. 26, Feb. 1954, p. 123-133; disc., p. 133-135.

Utilization of sewage for crop irrigation and fertilization studied over a three year period by lysimeter tests and field irrigation. Tables, graphs, diagram. 11 ref.

8890* Research on Activated Sludge. IV. Purification With Intense Aeration. A. Pasveer. *Sewage and Industrial Wastes*, v. 26, Feb. 1954, p. 149-159.

Purification capacity of an activated sludge plant is determined by oxygenation capacity. Photograph, tables. 7 ref.

8891* Bacteriological Studies of Sludge Digestion. IV. A Motile Facultative Anaerobe Isolated From Digested Sludge. T. C. Buck, Jr., C. E. Keefer, and Hester Hatch. *Sewage and Industrial Wastes*, v. 26, Feb. 1954, p. 164-170.

Investigations made at Back River sewage treatment works to isolate and study various bacteria responsible for digestion of sewage sludge. Micrographs, table. 2 ref.

8892* Process Engineering in Stream Pollution Abatement. A. N. Heller and M. E. Wenger. *Sewage and Industrial Wastes*, v. 26, Feb. 1954, p. 171-181.

In manufacture of an organic chemical, such as synthetic phenol, liquid (process) wastes were amenable to control by application of principles of process engineering. Diagrams, graphs, tables. 3 ref.

8893* Treatment of Complex Metal-Finishing Wastes. K. S. Watson. *Sewage and Industrial Wastes*, v. 26, Feb. 1954, p. 182-194; disc., p. 194-196.

Collection system, treatment plant, and cost of constructing and operating these facilities. Photographs, tables, diagram.

8894* Chromic Acid Recovery by Ion Exchange. R. J. Brink. *Sewage and Industrial Wastes,* v. 26, Feb. 1954, p. 197-202.

Equipment and operating procedures of installation for removing chromic acid from anodizing rinse water. Photograph, tables, diagrams.

8895* Determining Risks of Toxic Substances in Water. Edward J. Cleary. *Sewage and Industrial Wastes,* v. 26, Feb. 1954, p. 203-210; disc., p. 210-211.

Activity of Kettering Laboratory in determining water quality and toxicity. Table, photograph.

8896* High-Rate Activated Sludge Treatment and Its Relation to Stream Sanitation. II. Biological River Tests of Plant Effluents. K. Wuhrmann. *Sewage and Industrial Wastes,* v. 26, Feb. 1954, p. 212-220. (Translated and abstracted from *Gesundheits-Ingenier,* v. 72, 1951, p. 253, and *Strasse und Verkehr,* v. 5, 1951, p. 120.)

Experiments to test quality of effluents biologically, estimate amount of dilution necessary and establish a continuous relation between chemical composition of river water and kind of biocoenosis induced in the river. Photograph, diagram, graphs, tables. 12 ref.

8897* Power and Humus From Waste. F. H. Happold. *Times Review of Industry,* v. 8, new ser., Mar. 1954, p. 24-25.

Production of methane and fertilizer by controlled fermentation.

8898* R.A.F.'s Part in Oil Pollution Campaign. *Times Review of Industry,* v. 8, new ser., Mar. 1954, p. 41.

Problem of pollution of sea, coastal waters, and beaches by oil discharged from ships. Photograph.

8899* Sewage and Industrial Waste Developments During 1953. F. W. Mohlman. *Water & Sewage,* v. 101, Feb. 1954, p. 45-54.

Review of the year's problems, progress, and research. Photographs.

8900 Exhaust Nuisance Abatement With Activated Carbon. Kevin B. Magee. *Wire and Wire Products,* v. 29, Mar. 1954, p. 266, 340-341.

Possible solution to problem of air pollution from process gases discharged into air. Photograph, diagram.

See also:
7604 (desorption of gases in packed towers—book)

RUBBER AND ELASTOMERS

8901 Rubber Adhesives in Car Manufacture. W. H. Swire and E. H. Walton. *Adhesives & Resins,* v. 2, Jan. 1954, p. 3-7.

General account of ways these adhesives are used. Techniques of application. Photographs.

8902 Determination of Yellow Color in Raw Rubber Latex Films and Crepes. G. A. Kidder. *Analytical Chemistry,* v. 26, Feb. 1954, p. 311-315.

Includes graphs, tables. 3 ref.

8903* Determining the Wear Resistance of Soft Rubber. (German.) Siegmund Reissinger. *Archiv für technisches Messen,* 1953, no. 215, Dec., p. 277-280.

Four different abrasive-wear testing machines. Photographs. 30 ref.

8904 Heat Treat for Better Butyl. *Chemical and Engineering News,* v. 32, Feb. 8, 1954, p. 494.

New technique produces rubber with superior tensile strength, abrasion resistance, and resilience.

8905* Chemical Composition of Partially Chlorinated Rubbers. (French.) Maurice Troussier. *Comptes rendus,* v. 237, no. 25, Dec. 21, 1953, p. 1692-1694.

Various specimens were prepared by controlled reaction of Cl diluted 20 times its volume with N in a 1.5% rubber solution in CCl_4. Table. 4 ref.

8906* Plasticization of Rubber by Cylindrical Mixers. (French.) Eugène Stalinsky. *Comptes rendus,* v. 238, no. 7, Feb. 15, 1954, p. 806-808.

Determination of necessary time to affect desired plasticization of given weight of rubber. Tables.

8907* Influence of Molecular Weight of Rubber on Kinetics of Vulcanization and on the Formation of the Space Lattice. (Russian.) A. S. Novikov, G. M. Bartenev, and F. A. Galil-Ogly. *Doklady Akademii Nauk SSSR,* v. 94, no. 2, Jan. 11, 1954, p. 253-256.

Kinetics of vulcanization of individual fractions of butadiene-styrene rubber with various molecular weights. Graphs, table. 7 ref.

8908 Coagulant-Casting Process for the Manufacture of Hollow Articles From Natural Rubber Latex. P. Braber and G. W. van Raamsdonk. *India-Rubber Journal,* v. 126, Feb. 20, 1954, p. 7-10.

Materials, equipment, and process techniques. Photographs. 6 ref.

8909* Long-Term Aging of Elastomers Under Continuous Shear Load. G. L. Hall, F. S. Conant, and J. W. Liska. *India Rubber World,* v. 129, Feb. 1954, p. 611-616.

Satisfactory apparatus and method were developed. Method includes a measure of the change in modulus as well as total amount of creep. Importance of evaluating both quantities was demonstrated. Graphs, diagrams, photograph. 17 ref.

8910* Physico-Chemical and Rubber Reinforcing Properties of Super Abrasion Furnace Black. J. F. Svetlik, H. E. Railsback, and C. C. Biard. *India Rubber World,* v. 129, Feb. 1954, p. 617-620, 622.

Physico-chemical properties; processability studies; effect of variable quantities of Philblack E and varying of Philblack E and softener in cold rubber; road test data; and electrical conductivity results. Tables, graphs.

8911* Improved Temperature Uniformity of Calender Roll Surfaces Obtained by Electromagnetic Induction. Georges Ardichvili. *India Rubber World,* v. 129, Feb. 1954, p. 621-622.

Device employing magnetic current uses wall of the calendar roll as part of the apparatus greatly improving temperature uniformity of the surface of the roll. Diagrams.

8912* Effect of Moisture on Rate of Cure of Natural Rubber. Rolla H. Taylor, Frederick E. Clark, and William P. Ball. *India Rubber World,* v. 129, Mar. 1954, p. 751-755.

Apparatus and techniques of testing. Tables, diagram, graphs. 19 ref.

8913* Glossary of Terms Used in the Mechanical Rubber Goods Industry. *India Rubber World,* v. 129, Mar. 1954, p. 756-772, 775.

8914* Injection of Elastomeric Vinyls. II. Frank A. Martin. *India Rubber World,* v. 129, Mar. 1954, p. 777-779.

Preplasticizing screw-type machines. Molding of dry blends with conventional machines. Table, diagrams.

8915* Vulcanisation: Application of Unsteady-State Heat Conduction Theory. C. Cuthbert. *Institution of the Rubber Industry, Transactions,* v. 30, Feb. 1954, p. 16-28; disc., p. 28-32.

Time-temperature relations at selected points within a rubber article. Table, graphs. 19 ref.

8916* Influence of Organic Chemicals in Rubber Manufacture. F. A. Jones. *Institution of the Rubber Industry, Transactions,* v. 30; *Institution of the Rubber Industry, Proceedings,* v. 1, Feb. 1954, p. 25-32.

Reviews present practice. Forecasts other organic materials which will have many and varied effects on both properties and processing of rubber.

8917* Applied Force and Second Order Transitions of Rubber. F. T. Wall and Donald G. Miller. *Journal of Polymer Science,* v. 13, Feb. 1954, p. 157-165.

Second order transition temperatures of three different cures

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of natural rubber studied as functions of elongation. Tables, graph. 13 ref.

8918* The Structure of Neoprene. VI. Crystallization. VII. Infrared Analysis of Configuration. J. T. Maynard and W. E. Mochel. *Journal of Polymer Science*, v. 13, Mar. 1954, p. 235-262.

Includes graphs, tables, spectrographs. 29 ref.

8919* Latex Testing Methods. (German.) M. van den Tempel. *Kautschuk und Gummi*, v. 6, no. 12, Dec. 1953, p. WT250-WT252.

Tests for mechanical stability, KOH number, and ZnO sensitivity. Application of tests in processing of foam rubber. Graph. 7 ref.

8920* Heating and Destruction of Vulcanizates by Dynamic Stresses. (German.) P. Kainradl and F. Händler. *Kautschuk und Gummi*, v. 7, no. 1, Jan. 1954, p. WT1-WT7.

Tests show destruction effect of dynamic stresses depends on filler and conditions under which elastomers are produced. Table, graph, photographs, diagrams. 17 ref. (To be continued.)

8921* Development and Use of Perlon in Tires and Other Rubber Goods. (German.) K. Jehle. *Kautschuk und Gummi*, v. 7, no. 1, Jan. 1954, p. WT8-W12.

Principles of perlon and nylon production; methods of testing physical properties of polyamides; various applications.

8922* Heating and Destruction of Vulcanized Rubbers During Dynamic Stress. (German.) P. Kainradl and F. Händler. *Kautschuk und Gummi*, v. 7, no. 2, Feb. 1954, p. 34-42.

Dynamic stress experiments on various natural and synthetic rubbers. Tables, graphs. 22 ref.

8923* A New Coagulant for the Latex Dip Process. (German.) P. Braber and G. W. van Raamsdonk. *Kautschuk und Gummi*, v. 7, no. 2, Feb. 1954, p. 42-44.

Composition and application of a new coagulant developed to eliminate disadvantages inherent in calcium chloride-base coagulants. Micrographs. 4 ref.

8924 Effect of Previous Stress-Strain History on the Dynamic Hysteresis Loop for Rubber in Compression. D. M. Davies and H. McCallion. *Nature*, v. 173, Feb. 6, 1954, p. 262-263.

Results of recent test. Graphs.

8925 Test Cell for Measuring the Dielectric Strength of Plastomeric Materials in Air. Stanley I. Reynolds. *Review of Scientific Instruments*, v. 25, Feb. 1954, p. 177-179.

Special test cell using standard ASTM electrodes for measuring small specimens in air, up to a peak voltage of 50 kv. Photographs, graph, diagram. 7 ref.

8926 Dynamic Characteristics of Silicone Rubber. G. W. Painter. *Rubber Age*, v. 74, Feb. 1954, p. 701-706.

Dynamic modulus testing machine, having considerable flexibility and high efficiency of operation. Diagram, photograph, graphs. 8 ref.

8927 Extrusion Factors of Black Rubber Compounds. Isaac Drogin, Hester R. Bishop, and Paul Wiseman. *Rubber Age*, v. 74, Feb. 1954, p. 707-760.

Based on paper presented at ACS meeting, Chicago, Sept. 1953. Properties of black rubber compounds designed for extrusion, including processing features, extrusion characteristics, and reinforcement status. Tables, photographs, diagrams, graphs. 36 ref.

8928* Calculable Properties of Technical Rubber Mixtures. E. Schreuer. *Rubber Chemistry and Technology*, v. 27, Jan.-Mar. 1954, p. 201-208. (Translated from *Kolloid-Zeitschrift*, v. 128, no. 3, Mar. 1952, p. 159-164.)

Includes graphs, table. 6 ref.

8929* Rubber Sleeve Connectors for Plastic Pipes. (Russian.) E. I. Liubomirskii. *Stanki i Instrument*, v. 24, no. 12, Dec. 1953, p. 12-15.

Various types of construction. Diagrams, tables.

8930* Wear Tests on Rubber. (German.) K. Wellinger and H. Uetz. *VDI Zeitschrift des Vereines deutscher Ingenieure*, v. 96, no. 2, Jan. 11, 1954, p. 43-47.

Five different rubbers and one steel were tested by grinding paper, sand, and sandblasting. Diagrams, graphs, tables. 8 ref.

8931* Results of Research on Rubber Insulated Wire John T. Blake. *Wire and Wire Products*, v. 29, Feb. 1954, p. 162-165, 168.

Trend toward use of synthetic rubber and desirable properties. Table, graphs, photograph, micrograph.

Books and Miscellaneous Publications

8932 Symposium on Recent Developments in the Evaluation of Rubber. ASTM Special Technical Publication no. 136. 111 p. 1952. American Society for Testing Materials, Philadelphia. (TS1892 Am35sr)

Papers and discussions in this volume presented as a Symposium, held during 27th session, June 26, 1952, at 50th Anniversary Meeting of ASTM. Covers tests and instruments used for determining properties and purity of crude rubber.

See also:
7582 (production of synthetic rubber)
8232 (viscometer for rubbers)
8855 (gasket materials)
8929 (rubber sleeve connectors for plastic pipes)

SPACE HEATING AND CONDITIONING

8933 Automatic Controls for Air-Conditioned Aircraft. W. F. Tice. *Aero Digest*, v. 68, Feb. 1954, p. 36, 38.

Complex systems all use simple, basic bridge circuit for temperature control. Photographs, diagrams.

8934* Air Conditioning Afloat—Recent Developments. A. S. Panella and E. H. Honegger. *American Society of Naval Engineers, Journal*, v. 66, Feb. 1954, p. 63-75.

Compares operating experience of freon plants using direct expansion cooling coils with steam jet plants using chilled water cooling coils. Diagrams.

8935 Heating Betatron Laboratory. Jack Williams. *Heating, Piping & Air Conditioning*, v. 26, Mar. 1954, p. 107-109.

Problems, operation, and control. Photographs, diagram.

8936 How Air Washers Perform When Cooling. H. M. Hendrickson. *Heating, Piping & Air Conditioning*, v. 26, Mar. 1954, p. 119-123.

Saturating and heat transfer efficiences. Table, graphs, diagrams. 8 ref.

8937 "Check List" for Design of Testing Rooms. F. F. Stevenson. *Heating, Piping & Air Conditioning*, v. 26, Mar. 1954, p. 124-128.

Factors considered in designing air conditioning systems. Photograph.

8938 Field Test of a Water-To-Air Heat Pumps. S. L. Pappas, F. R. O'Brien, and C. W. Cheatham. *Heating and Ventilating*, v. 51, Feb. 1954, p. 79-82.

Results of two year test period. Graphs.

8939 Insolation on Cloudless Days. I. F. Hand. *Heating and Ventilating*, v. 51, Feb. 1954, p. 97-100.

Charts show daily hourly values of insolation on various surfaces at time of solstices and equinoxes over continental U. S. Charts.

8940 Surface and Water Temperatures for Radiant Heating Systems. L. J. LaTart, N. W. Smith, and D. L. Mills. *Heating and Ventilating*, v. 51, Feb. 1954, p. 101-103.

Determination of pipe or tube size, spacing in panels, and mean water temperature required in cells to produce required panel out-put under design load. Tables.

8941 The Degree-Day. A Fuel Estimating Unit. Clifford Strock. *Heating and Ventilating*, v. 51, Mar. 1954, p. 102-116.
Describes application. Data for 1212 locations. Tables, graph.

8942 A Transient-Flow Method for Determination of Thermal Constants of Insulating Materials in Bulk. I. Theory. J. H. Blackwell. *Journal of Applied Physics*, v. 25, Feb. 1954, p. 137-144.
Development of new approximate mathematical treatment, using methods of operational calculus. 9 ref.

8943 Radiant or Infra-Red Heating by Gas. Michael S. Johns. *Machinery Lloyd (Overseas Ed.)*, v. 26, Jan. 30, 1954, p. 79-81.
Design and its application in a plant. Photographs.

8944 Separation of Incident and Emitted Radiations in a Solar Furnace by Means of Rotating Sectors. Willi M. Conn and Gene Braught. *Optical Society of America, Journal*, v. 44, Jan. 1954, p. 45-47.
Experimental procedure and results. Diagram, graph, photograph. 4 ref.

8945* Application of Solar Energy. (Russian.) M. V. Kirpichev and V. A. Baum. *Priroda*, v. 43, no. 1, Jan. 1954, p. 45-53.
Water heating installations for showers, laundry, and livestock in the U.S.S.R. Photographs, diagrams.

8946* Design of Exhaust System. VII. Fan Characteristics. F. H. Stebbins. *Sheet Metal Worker*, v. 45, Mar. 1954, p. 68-70, 130.
Frictional resistance of piping. Graphs. (To be continued.)

See also:
7868 (power for air conditioning)

TEXTILES AND FIBERS

8947* A Qualitative Analysis of the Synthetic Fibers. Marjorie Lundegard and Elizabeth D. Roseberry. *American Dyestuff Reporter*, v. 43, Feb. 15, 1954, p. 93-97.
Identification of nylon, Dacron, Orlon, Acrilan, X-51, Dynel, Saran, and polyethylene fibers by chemical and microscopic tests. Diagrams, tables. 4 ref.

8948* The Influence of Applied Forces on the Felting of Wool. A. K. van der Vegt and G. J. Schuringa. *Textile Research Journal*, v. 24, Feb. 1954, p. 99-108.
Includes photograph, graphs, tables. 20 ref.

8949* New Textile Fibers With the Structural Elements of Natural Cellulosic Fibers. Jack Compton. *American Dyestuff Reporter*, v. 43, Feb. 15, 1954, p. P103-P111.
Structure of natural vegetable fibers. Advantages of cyanoethylation and acetylation of cotton. Diagrams, tables, micrographs, photographs, graphs. 46 ref.

8950 Interrelations of Chemical Science and the Textile Industry. D. W. Hill. *Chemistry & Industry*, 1954, no. 6, Feb. 6, p. 148-153.
Increased uses of chemistry in fiber technology.

8951* Ordered Structure of Hydrated Cellulose Films. (Russian.) A. L. Zaides and I. G. Stoianova-Sinitskaia. *Doklady Akademii Nauk SSSR*, v. 92, no. 3, Sept. 21, 1953, p. 601-602 + 1 plate.
Investigates natural cellulose (ramie yarn) by electron-microscopic and X-ray and electron-structural analysis. Presence of geometrically ordered regions with a microcrystalline structure is shown. Photographs, micrographs. 5 ref.

8952 Recent Developments in Heating and Drying Ovens for Textile Processing. E. Gilbert Silven. *Industrial Heating*, v. 21, Feb. 1954, p. 323 + 9 pages.
Uses of gas in heating and drying operations for processing new synthetic fibers and fabrics with description of typical installations of gas-burning equipment. Photographs.

8953* Pigment Colors in Textile Printing. Charles S. Rowland. *Interchemical Review*, v. 12, Winter, 1953-54, p. 97-106.
Reviews progress in application. Photographs. 4 ref.

8954* An X-Ray Study of the Decomposition Product of the Ethylamine-Cellulose Complex. Leon Segal, Leopold Loeb, and Joseph J. Creely. *Journal of Polymer Science*, v. 13, Mar. 1954, p. 193-206.
Includes X-ray diffraction pattern, diagram, tables, X-ray spectrographs. 7 ref.

8955* Studies on Tamarind Kernel Powder. IV. Comparative Mildew Susceptibility of Sizing Materials and the Effect of Steeping T. K. P. on Sizing Quality. W. G. MacMillan, I. B. Chakraverti, and P. N. Pal. *Journal of Scientific & Industrial Research*, v. 13, sec. B, Jan. 1954, p. 66-71.
Mildew susceptibilities of some textile sizes. Tables, graph. 12 ref.

8956* The Microstructure of Ramie. (German.) Alfred Vogel. *Makromolekulare Chemie*, v. 11, nos. 2-3, Dec. 1953, p. 111-130.
Purified ramie-fibers were mechanically disintegrated. Double shadowed electron microscopic preparations revealed microfibrils with an average width of 173-203 A and a thickness of about 30 A. Diagrams, table, micrographs. 40 ref.

8957* Shrinkage of Cotton Broadcloth Shirts. Mary Anna Grimes and Carolyn A. Werman. *Modern Textiles Magazine*, v. 35, Mar. 1954, p. 48, 71-73.
Study indicates mechanically stabilized cotton fabrics usually shrink more than widely-advertised 1%. Graphs, tables. 4 ref.

8958* Better Blends Through Volumetric Analysis. Philip E. Sperling and Gilbert H. Steinberg. *Modern Textiles Magazine*, v. 35, Mar. 1954, p. 64 + 4 pages.
Blending on basis of volume rather than weight. Methods determine density of fiber and yarn. Diagrams, tables, graphs.

8959* The Stress-Strain Curve of Materials With Fiber Structure. Textiles, Leather, and Paper. (German.) H. Kägi. *Schweizer Archiv für angewandte Wissenschaft und Technik*, v. 19, no. 12, Dec. 1953, p. 366-379.
Special concepts on strength testing of fibrous materials. Graphs.

8960* Symposium on Textile Printing. *Society of Dyers and Colourists, Journal*, v. 69, Dec. 1953, p. 525-687 + 3 plates.
Includes "The Production of Printing Rollers by Eelectrodeposition", E. A. Ollard; "The Production of Pictorial Effects in Textile Printing", N. W. Yelland; "Mélange or Vigoureux Printing", F. Buxtorf and A. Wiazmitinow; "The Production of Metal Screens", G. Waller; "Doctor Streaks—Their Origin and Prevention", Emil A. Krähenbühl; "The Flow Properties of Textile Printing Pastes", R. L. Derry and R. S. Higginbotham; "Rheology and the Letterpress Printing Process", N. Casson; "The Reduction of Vat Dyes in Printing Pastes", W. J. Marshall and R. H Peters; "An Investigation of the Chemical Reactions Involved in the Use of Sodium Formaldehyde-Sulphoxylate in Textile Printing", R. J. Hannay and W. Furness; "Thiourea Dioxide (Formamidinesulphinic Acid)—A New Reducing Agent for Textile Printing", P. Krug; "Fast-To-Light Basic Prints on Viscose Rayon", W. S. Miller; "Control of Padding Processes by Radioactive Isotope Labelling", H. B. Hampson and E. W. Jones; "The Printing Efficiency of Vat Dyes", A. G. H. Michie and R. Thornton; "Dye Transfer in Dyeing and Printing", G. D. Myers and H. A. Turner; "Developments in the Application of Azoic Dyes in Printing", B. Jomain; "Resists Under Azoic Dyes", J. Frei; "New Developments in the Application of Phthalocyanines in Textile Printing", F. Gund; and "Observations on Textile Printing in the U.S.A.", Otto Habel. Tables, graphs, diagrams, photographs. 133 ref.

8961* The Textile Trade and the Newer Fibres. F. H. Clayton. *Society of Dyers and Colourists, Journal*, v. 70, Jan. 1954, p. 7-13.
World consumption of all fibers is still increasing. Use of man-made fibers is increasing much more rapidly than that of natural fibers. Properties of synthetic fibers and some applications for which they are suitable. Graphs, tables.

Textiles and Fibers

8962* Studies in the Printing of Terylene Polyester Fibre. A. G. H. Michie. *Society of Dyers and Colourists, Journal,* v. 70, Jan. 1954, p. 13-15; disc., p. 15.

Methods are outlined, stress being placed on use of pressure steaming and swelling agents for disperse dyes. Graph.

8963* The Heat Setting of Terylene Polyester Filament Fabrics in Relation to Dyeing and Finishing. D. N. Marvin. *Society of Dyers and Colourists, Journal,* v. 70, Jan. 1954, p. 16-21; disc., p. 21.

Dry heat setting of Terylene filament fabrics in relation to dimensional stability; wet creasing; stiffness and recovery from dry creasing; and dyeing properties. Graphs, tables.

8964* Dyeing of Nylon Yarn in Package Form. W. S. Willson. *Society of Dyers and Colourists, Journal,* v. 70, Jan. 1954, p. 22-24; disc., p. 24.

Method of dyeing continuous-filament nylon yarn in cake form which developed and proved bulk scale. 4 ref.

8965* A Study of the Afterchrome Process. J. F. Gaunt. *Society of Dyers and Colourists, Journal,* v. 70, Feb. 1954, p. 46-56; disc., p. 56-57.

Dyes and dyeing of wool. Tables. 30 ref.

8966* The Dyeing of Acetate Rayon With Disperse Dyes. I. Aqueous Solubility and the Influence of Dispersing Agents. II. The Relation Between Aqueous Solubility and Dyeing Properties. C. L. Bird. *Society of Dyers and Colourists, Journal,* v. 70, Feb. 1954, p. 68-77.

Includes tables, graphs. 12 ref.

8967* Here's the Dope on Dope-Dyed. *Textile Industries,* v. 118, Mar. 1954, p. 126-133.

Equipment and processes for weaving synthetic fibers, colored before extrusion by incorporating pigments into spinning solution. Photographs, diagrams.

8968* The Absorption of Chrysophenine G by Cotton and by Acidic Oxycelluloses. Marjorie M. Bilsbury, J. T. Martin, and H. A. Standing. *Textile Institute, Journal, Transactions,* v. 45, Jan. 1954, p. T1-T20.

Results of experimental studies. Graphs, tables. 11 ref.

8969* The Direct Dyeing of Cellulose: A Method for the Analysis of Equilibrium Absorption Data in Terms of Current Quantitative Theories. H. A. Standing. *Textitle Institute, Journal, Transactions,* v. 45, Jan. 1954, p. T21-T29.

Includes graphs. 7 ref.

8970* The Frictional Properties of the Wool Fibre. B. Lincoln. *Textile Institute, Journal, Transactions,* v. 45, Feb. 1954, p. T92-T107.

Directional frictional effect of wool fiber is discussed in terms of geometry of an ideal scale profile, assuming that real areas of contact are formed by elastic deformation of the scale material. Tables, graphs, diagrams. 26 ref.

8971* The Discharge of Electrified Textiles. J. A. Medley. *Textile Institute, Journal, Transactions,* v. 45, Feb. 1954, p. T123-T141.

Discharge processes, conveniently utilized for dissipation of static, are analyzed quantitatively and shown to be of three main types. Diagrams, graphs. 18 ref.

8972* Stiffening Agents and How They Work. A. C. Nuessle. *Textile World,* v. 104, Mar. 1954, p. 86-88, 236, 238-239.

Chemical and physical properties of a number of finishing materials; their applications and reactions with cellulose and various synthetics. Diagrams, table, graph.

8973* New Thread Plant Uses Versatile Dyeing Equipment. George M. Moisson. *Textile World,* v. 104, Mar. 1954, p. 111-113.

Equipment, plant layout, and operating procedures. Photographs.

8974* Recent Progress in the Dyeing and Sizing of Polyvinyl Chloride Fibers. (French.) M. Louis Gord. *Textil-Rundschau,* v. 9, no. 2, Feb. 1954, p. 70-76.

Progress and results of research in France on use of acetate, pigment, indigosol, sulfur, and naphthol dyes for PVC fibers. Treatment of fibers with anti-friction coatings to avoid charging with static electricity, special methods for sizing, and production of a suede finish. Tables.

8975* The Synthetic Fibers "Phrilon" and "Redon". (German.) Jürgen Wrieth. *Textil-Rundschau,* v. 9, no. 2, Feb. 1954, p. 83-84.

Physical constants, general properties, and applictaions of a superpolyamid fiber, with high wear and moisture resistance and low specific weight; used both in textile industry and in technical applications and a polyacrylnitril fiber which has a high resistance against moths, microbes, and bacteria.

See also:
7647 (chromium in textiles)
7695 (anthraquinone dyes)
8004 (textile engineering outlook)
8258 (lubricants for textile machinery)
8812 (washing and drying of textiles with sonic frequencies)
8818 (textiles from emulsion polymers)

THERMODYNAMICS

8976 Heat Transfer to Constant-Property Laminar Boundary-Layer Wedge Flows With Stepwise and Arbitray Wall-Tempeature Variation. Steve Scesa and Solomon Levy. *ASME, Transactions,* v. 76, Feb. 1954, p. 279-286; disc., p. 286.

Analysis for determination of heat transfer for bodies in constant-property two-dimensional laminar flow with a free-stream velocity variation and a stepwise wall-temperature variation. Graphs, table. 8 ref.

8977 A Summary of NACA Research on Heat Transfer and Friction for Air Flowing Through Tube With Large Temperature Difference. Benjamin Pinkel. *ASME, Transactions,* v. 76, Feb. 1954, p. 305-317.

Results of experimental and analytical studies to determine heat-transfer and friction coefficients for flow of air through tubes with large difference in temperature between tube wall and air for circular and non-circular cross-sectional tubes with various degrees of surface roughness. Diagrams, graphs, photomicrograph. 26 ref.

8978 Heat Transfer by Radiation. Henry E. Robison. *Brick & Clay Record,* v. 124, Feb. 1954, p. 69, 71, 73.

New vistas for applications of solar and atomic energies. Graphs, diagrams. 4 ref.

8979 Heat Transfer by Convection. Henry E. Robison. *Brick & Clay Record,* v. 124, Feb. 1954, p. 73-74, 76, 79.

Includes diagrams. 2 ref.

8980 Shortcut to Heat Exchanger Design. VI. C. H. Gilmour. *Chemical Engineering,* v. 61, Mar. 1954, p. 209-213.

Cutting time for designing heat exchangers by conventional methods. Tables, graph.

8981* Performance Values of New Type Graphite Heat Exchangers. (German.) K. Vogel. *Chemie-Ingenieur-Technik,* v. 25, no. 12, Dec. 1953, p. 701-705.

Determnies performance and loading capacity of graphite heat exchangers. Diagrams, photographs, graphs, table. 9 ref.

8982* Heat Transfer in Vertical Evaporator Tube. (German.) Emil Kirschbaum. *Chemie-Ingenieur-Technik,* v. 26, no. 1, Jan. 1954, p. 25-28.

Temperatures of tube wall and liquid within the tube measured to determine heat transfer coefficient. Diagrams, graphs. 3 ref.

8983* Heat Transfer in Liquid Electric Nonconductors Under Influence of Electric Fields. (German.) Ernst Schmidt and W. Leidenfrost. *Chemie-Ingenieur-Technik,* v. 26, no. 1, Jan. 1954, p. 35-38.

Equipment determines heat transfer coefficient of various liquids. Thermal conductivity increased with rising temperature 2 to 5 times normal value. Diagrams, graphs, photographs.

8984* Determining Heat Conducticity, Heat Capacity, and Heat Penetration Coefficient With an Accelerated Method. (German.) O. Krischer. *Chemie-Ingenieur-Technik*, v. 26, no. 1, Jan. 1954, p. 42-44.

Method of simultaneous determination by a short-time experiment. Diagrams, graphs, photographs.

8985* The Wanitschew Method of Elementary Balances for the Calculation of Transient Heat Fluxes. (German.) G. Sarukhanian. *Forschung auf dem Gebiete des Ingenieurwesens*, v. 19, Ausgabe B, no. 4, 1953, p. 101-104.

Method calculates temperature fields due to cooling and heating processes. Diagrams, graphs, table. 4 ref.

8986 Finned Tubes in Heat Exchangers. Richard B. Williams and Donald L. Katz. *Petroleum Refiner*, v. 33, Mar. 1954, p. 145-149.

Tests compare plain and finned tubes in shell and tube exchangers. Provide performance data needed to design finned tube units. Photographs, tables, graphs. 8 ref.

8987 Experimental Determination of Local and Mean Coefficients of Heat Transfer for Turbulent Flow in Pipes. I. T. Aladyev. *U. S. National Advisory Committee for Aeronautics, Technical Memorandum* 1356, Feb. 1954, 18 p. (TL570 Un3tm). (Translated from *Izvestiya Akademii Nauk SSSR, Otdelenie Tekhnicheskikh Nauk*, no. 11, 1951, p. 1669-1681.)

Investigates changes of local and mean heat-transfer coefficients along pipe length. Graphs, tables, diagram. 10 ref.

8988* Thermodynamical Calculation of the State of Combustion Products in a Closed Space. (Russian.) A. I. Rozlovskii and Iu. Kh. Shaulov. *Zhurnal Fizicheskoi Khimii*, v. 27, no. 11, Nov. 1953, p. 1610-1616.

Method is applicable to determination of heat effect of dissociation reactions and heat capacities of components of dissociated mixture. 4 ref.

Books and Miscellaneous Publications

8989 Heat Transfer Symposium Engineering Research Institute. 286 p. 1953. Univ. of Michigan Press, Ann Arbor. (QC320 H35)

Fundamental engineering topics such as fluid mechanics, thermodynamics, elasticity, structures, dynamics, and electronics.

See also:
7722 (thermodynamic activity of S in Fe-C-S alloys)
7736 (thermodynamics of organic halides)
8191 (thermodynamics of rockets)
8865 (thermodynamic analysis of polystyrene)

WELDING AND JOINING

8990* Novel Method of Speeding Up Manual Arc Welding. (Russian.) L. Gillemot. *Acta Technica Academiae Scientiarum Hungaricae*, v. 7, nos. 3-4, 1953, p. 277-292.

Principle of double rod welding; tests showing 40 to 50% economy in energy consumption; and coating on welding rods. Diagrams, tables.

8991* Strength Tests of Bonded Light Metal Joints. (German.) P. Brenner and A. Matting. *Aluminum*, v. 30, no. 1, Jan. 1954, p. 3-9.

Strength and stress distributions studied for static and dynamic loads on monocoque structures. Graphs, photographs, tables. 6 ref.

8992* Tests of Electric Flash Butt-Welded Rails. R. E. Cramer and R. S. Jensen. *American Railway Engineering Association, Bulletin*, v. 55, no. 514, Feb. 1954, p. 684-694.

Rolling-load and physical tests. Tables, photographs.

8993* Strength Properties of Arc Welds of Water Quenched Basic Bessemer Steel. (German.) Jakob Colbus. *Archiv für das Eisenhüttenwesen*, v. 25, nos. 1-2, Jan.-Feb. 1954, p. 77-84.

Shows superiority of water-quenched, Al-killed steels with 0.15 to 0.20% C. Diagrams, graphs, tables. 6 ref.

8994* Experiences With Ultrasonic Reflectoscope Inspection of Main Seam Welds of Seven Large Spheres. Levi Tarr. *ASTM Bulletin*, 1954, no. 196, p. 54-60; disc., p. 60.

Reflectoscope indications obtained in weld inspections compared with radiographs, trepan plugs, and Arcair gouging observations. Diagrams, photographs, tables, radiographs.

8995 The Developmnet of Metal-Arc Welding and Electrodes During the Past Half-Century. E. Flintham. *British Welding Journal*, v. 1, Jan. 1954, p. 3-10.

Early types of electrodes and arc-welding processes. Progress of metal-arc welding, with its successes and failures and post war development. Diagrams, photographs, graph, table. 5 ref.

8996 Effect of Steel Quality on Spot-Welding Properties. J. E. Roberts and H. E. Dixon. *British Welding Journal*, v. 1, Jan. 1954, p. 27-35.

Experiments determine differences in spot weldability between five grades of 18 S.W.G. low-carbon steel, of deep- or extra deep-drawing quality. Tables, graphs, photographs.

8997 Cold Arc Welding of Gray Cast Iron Using a Granular Flux and Gray-Iron Electrodes. A. I. Zelenov. *Henry Brutcher, Altadena, Calif., Translation no.* 3154, 8 p. (From *Avtogennoe Delo*, v. 24, no. 4, 1953, p. 7-9.)

Welds, using either a.c. or d.c., are identical with base metal, easy to machine, and free from hard spots. Micrographs, photographs, diagrams, graph, tables.

8998 Electrodes for the Welding of Acid-Resisting Cr-Ni-Mo-Ti Steels. G. A. Ukolov. *Henry Brutcher, Altadena, Calif., Translation no.* 3188, 5 p. (From *Avtomaticheskaya Svarka*, v. 6, no. 3, 1953, p. 46-49.)

Favorable results obtained by addition of ferromanganese to coating of electrodes. Tables, photograph. 3 ref.

8999 Bond Failures in Babbitted Bearings. A. H. Lewis. *Canadian Metals*, v. 17, Feb. 1954, p. 40, 42, 44.

Investigates rate of cooling and direction of casting, important variables in obtaining satisfactory bonds. Tables.

9000 Application of Pressed Powder Technique for Production of Metal-to-Ceramic Seals. Walter Knecht. *Ceramic Age*, v. 63, Feb. 1954, p. 12-13; disc., p. 13.

Past work and present advantages of method in electron tube manufacture.

9001* Glass-Metal Union by Means of Plastic Adhesives Applied to the Production of Cathode-Ray Tubes. (Spanish.) R. Mearin. *Ciencia y técnica de la Soldadura*,, v. 3, no. 15, Nov.-Dec. 1953, 4 p.

Experimental work on a glass-metal seal capable of supporting a vacuum of the order of 1×10^{-5} mm. Hg. Diagrams.

9002* Influence of Hydrogen and Silicon on Electric Arc Welding. (Spanish.) J. L. Zuloaga. *Ciencia y técnica de la Soldadura*, v. 3, no. 15, Nov.-Dec. 1953, 8 p.

Methods of evaluating H in steels; apparatus used at the Instituo de la Soldadura, Madrid. Diagrams. 17 ref.

9003 Atomic Hydrogen in the Research Laboratory. R. L. F. Boyd and N. D. Twiddy. *Electronic Engineering*, v. 26, Feb. 1954, p. 78-79.

Instrument employs a R.F. corona to produce dissociation in welding and brazing. Photographs, diagram.

9004* "Slope Control" Lengthens Tip Life and Improves Weld Quality. Chas. Bruno. *Industry & Welding*, v. 27, Mar. 1954, p. 44-46, 67.

Spot welding of Al with conventional single-phase alternating-current type welders. Tables, oscillograms.

9005* How to Interpret Weld Radiographs. *Industry & Welding*, v. 27, Mar. 1954, p. 58-62, 64-66.

Brief account of factors to be considered in interpreting radiographs of welds made by various electric-arc processes in steels. Radiographs.

Welding and Joining

9006 Nature of Adhesion. Frank W. Reinhart. *Journal of Chemical Education*, v. 31, Mar. 1954, p. 128-132.

Adhesion is attributed to forces of attraction between atoms and molecules, namely electrostatic, co-valent, and metallic bonds, and secondary or van der Waals forces. Diagrams, table. 11 ref.

9007* Microcracks in Weld Metal. P. C. Van Der Willigen. *Journal of Scientific & Industrial Research*, v. 13, sec. A, Jan. 1954, p. 26-30.

The "flakes" caused by presence of H; effect of cooling rate; and composition on embrittlement of weld metal. Micrograph, tables. 4 ref.

9008 Vaporised Flux for Bronze Welding. *Machinery Lloyd (Overseas Ed.)*, v. 26, Jan. 30, 1954, p. 107-108.

Method provides uniform and easily regulated flow of flux. Diagram.

9009 Evolution of Hydrogen From Weld Metal. K. Winterton and C. L. M. Cottrell. *Metallurgia*, v. 49, no. 291, Jan. 1954, p. 3-7.

Hydrogen evolving at room temperature from freshly made steel weld metal measured by a simple displacement method. Values of evolved H are quoted for 19 electrodes. Photographs, tables, graphs. 4 ref.

9010 The Cold Pressure Welding of Metals. J. E. Hughes. *Metallurgia*, v. 49, no. 291, Jan. 1954, p. 15-19.

Using a method of cold welding cylindrical rod specimens in which deformation may be confined to interfacial zone, weldabilities of Al, Cu, and Fe were studied. Diagrams, tables, photographs, micrographs. 7 ref.

9011* Distribution of Gases in Oxy-Acetylene Cutting and Welding. (French.) *Métallurgie et la construction mécanique*, v. 85, no. 12, Dec. 1953, p. 981, 983-984.

Rational use and economy of gases in welding. Photographs, diagram.

9012 Metal to Non-Metal Brazing. *Metal Treatment and Drop Forging*, v. 21, Feb. 1954, p. 66.

Materials and techniques.

9013* Adhesives for Paper, Film and Foil Lamination. James R. Lyon. *Paper Mill News*, v. 77, Feb. 27, 1954, p. 14-17.

9014 A Technique of Soldering to Thin Metal Films. Richard B. Belser. *Review of Scientific Instruments*, v. 25, Feb. 1954, p. 180-183.

Indium and certain of its alloys as a solder, without a flux. Adherence to thin metal films readily obtained without destruction of the film. Tables, micrographs. 6 ref.

9015 The Use of Solder Paint in Container Manufacture. G. Taylor. *Sheet Metal Industries*, v. 31, no. 322, Feb. 1954, p. 123-124, 128.

A strip of paint 1/16 in. wide applied where required, provided enough solder to sweat the side seam of a can. Drawings.

9016 The Twin-Arc Welding Process. W. D. Waller. *Sheet Metal Industries*, v. 31, no. 322, Feb. 1954, p. 131-135.

Fast, low-cost process to meet initial high costs of automation. Tables, photographs, diagram.

9017* The Welding of Nickel and High Nickel Alloys. Lester F. Spencer. *Sheet Metal Worker*, v. 45, Feb. 1954, p. 65-66, 68, 70.

Jigs and factors influencing selection of welding methods. Diagrams, tables, photograph. (To be continued.)

9018* Glue and Gluing. XXIX-XXXI. John E. Hyler. *Southern Lumberman*, v. 188, Feb. 1, p. 41-42, 44, 67; Feb. 15, p. 51-52, 54-55; Mar. 1, 1954, p. 41-42, 44, 46.

Stirring or beating elements incorporated in modern glue mixers; equipment and methods for gluing lumber edgewise; types of joints; methods of gluing, clamping, and processing. Photographs.

9019 SIGMA Welding of Carbon Steel. T. McElrath and R. T. Telford. *Steel*, v. 134, Feb. 22, 1954, p. 104-106.

From a paper presented at the Annual meeting, AWS, Fall, 1953. With porosity problems well on the way to solution, inert gas-metallic arc process stands to move more rapidly into fields dominated by coated-electrode welding. Photograph, graph, diagrams, radiographs, table.

9020* OK R3 and OK R6. New Basic Stainless Steel Electrodes. (Swedish.) T. Hellerström. *Svetsaren*, v. 18, no. 3, 1953, p. 36-39.

Welding properties of eight different austenitic, ferritic, and ferritic-austenitic electrodes. Tables, photographs.

9021 Testing High-Strength Silver-Brazing Alloys. Karl M. Weigert. *Welding Engineer*, v. 39, Mar. 1954, p. 44-45.

Shear and tensile tests. Diagram, graphs. 8 ref.

9022 Fabrication of a Zirconium-Lined Reaction Vessel. O. G. Paasche and A. J. Killin. *Welding Journal*, v. 33, Feb. 1954, p. 115-118.

Welding of Zr is accomplished by inert-gas-shielded process with protection by inert gas on the underside of the weld. Photographs, diagrams, table.

9023 Silver and Gold for Brazing Electronic Components. A. W. Swift and R. J. Metzler. *Welding Journal*, v. 33, Feb. 1954, p. 119-123.

Alloys used for brazing various components employed in electronic industry. Photographs, tables. 6 ref.

9024 Arc Characteristics for Consumable-Electrode Gas-Shielded Welding. R. W. Tuthill. *Welding Journal*, v. 33, Feb. 1954, p. 128-132.

Experimental investigation of inert-gas-shielded metal arc establishes v.-amp. curves for different metals. Graphs, diagram, table, photograph.

9025 New Development in Fluxes for Automatic Welding and Hard Surfacing. L. K. Stringham. *Welding Journal*, v. 33, Feb. 1954, p. 132-136.

Advantages of mixing properly formulated finely ground particles of flux ingredients together with a proper binder and drying resultant agglomerate. Photographs.

9026 Soldering of Aluminum. J. D. Dowd. *Welding Journal*, v. 33, Mar. 1954, p. 113S-120S.

Preparation of soldered joints in Al and its alloys and resistance to corrosion. Graphs, tables, photograph. 11 ref.

9027 Effect of Reinforcement on Performance of Weldments. Carl E. Hartbower. *Welding Journal*, v. 33, Mar. 1954, p. 141S-146S.

Reinforcement has a tendency to raise transition temperature of a weldment. Its removal in critical areas may sometime be desirable. Photographs, graphs, micrograph. 3 ref.

9028 Fusion Welding of Commercially Pure Titanium. Francis H. Stevenson. *Welding Journal*, v. 33, Mar. 1954, p. 147S-153S.

Techniques for producing acceptable welds by inert-gas-shielded W-arc method. Photographs, tables, graph.

9029 Nondestructive Test Methods for Inspection of Welded Joints. R. J. Krieger, S. A. Wenk, and R. C. McMaster. *Welding Journal*, v. 33, Mar. 1954, p. 154S-160S.

Application of techniques to ship structures. Table. 3 ref.

9030 Aspects of Welding Research in British Merchant Shipbuilding. II. R. B. Shepheard. *Welding and Metal Fabrication*, v. 22, Feb. 1954, p. 69-76.

Development of weldable alloys for marine use; structural tests on welded and riveted ships. Photographs, diagrams. 28 ref.

9031 Effect of Surface Conditions on Porosity and Mechanical Properties of Weld Metal. K. Winterton. *Welding and Metal Fabrication*, v. 22, Mar. 1954, p. 101-104.

Effects of light machine oil, gas-cut edges, rust and scale on plate surface. Tables, photographs, diagram. 3 ref.

Books and Miscellaneous Publications

9032 Study and Recommendation for the Welding and Brazing of Individual Diesel Locomotive Parts as Well as the Hardfacing of Wearing Parts. Otto Gier, chairman. Paper from OFFICIAL PROCEEDINGS OF THE 1953 ANNUAL MEETING MASTER BOILERMAKERS' ASSN. p. 101-113; disc., p. 120-124. 1953. Master Boilermakers' Assn., Albert F. Stiglmeier, Secretary, Albany 8, N. Y. (TJ281 M39o)

Includes photographs.

See also:
7562 (adhesives in resin manufacture)
7792 (fixation of Ta to Cu by brazing)
7787 (voltage regulation of circuits for welded load)
8433 (heat treating stainless steel welds)
8471 (fractures in welded construction)
8523 (strain measurement of welded structure)
8634 (strength properties of welded stainless steel)
8672 (non-destructive tests of welds)
8861 (technique of welding thermoplastics)
8901 (rubber adhesives)

WOOD AND FOREST PRODUCTS

9033* Hemlock Slabs as a Source of Pulp and Tannin. Norman F. Roger, Walter H. Koepp, and Edward L. Griffin, Jr. *American Leather Chemists' Association, Journal*, v. 49, Feb. 1954, p. 75-91.

New sources of domestic vegetable tanning materials to replace chestnut wood. Tables, photographs, diagram. 9 ref.

9034* Method for Determining Porosity of Cigarette Paper. (German.) W. F. Homann. *Chemische Technik*, v. 5, no. 12, Dec. 1953, p. 716-717.

Equipment for determining air permeability. Diagram.

9035* The Story and Purpose of Paper. A Guide for Users. V. "Fourdrinier". *Jobbing Printer*, v. 6, Feb. 1954, p. 14-17.

Equipment and methods of papermaking. (To be continued.)

9036* Growth Rate and Specific Gravity in Conifers. Stephen H. Spurr and Wen-yeu Hsiung. *Journal of Forestry*, v. 52, Mar. 1954, p. 191-200.

Influence of growth conditions on specific gravity of wood. Tables, diagrams. 84 ref.

9037* The Oxidative Reduction of Alkali Celluloses From Beech-Wood Sulfite Celluloses. (German.) Werner Bandel. *Makromolekulare Chemie*, v. 11, nos. 2-3, Dec. 1953, p. 87-96.

Polyose content of wood in the pulp found to be a factor for velocity of degradation in alkali cellulose. Graphs. 17 ref.

9038* How Alaska Pine & Cellulose Modernized the Port Alice Mill. *Paper Trade Journal*, v. 138, Feb. 19, 1954, p. 16-24.

Without increasing productive capacity of the mill, several million dollars were spent to raise quality of its dissolving pulp. Photographs.

9039* A New Paper Pigment. Silene EF in Paper. L. B. Taylor. *Paper Trade Journal*, v. 138, Feb. 26, 1954, p. 53-56.

Information on behavior of a calcium silicate pigment in paper furnishes. Graph, tables, micrographs.

9040* Newest Patterns in Continuous Pulping Being Set by American Box Board Co. *Paper Trade Journal*, v. 138, Mar. 5, 1954, p. 14-18, 21-22.

Improved hardwood pulping by continuous semi-chemical pulp mill at Filer City, Mich. Photographs, flow diagram.

9041* A New Concept for Drying Paper and Board. J. R. Gillis. *Paper Trade Journal*, v. 138, Mar. 12, 1954, p. 18-20.

Disadvantages of conventional dryers; advantages of new system; and equipment and techniques of process. Diagram.

9042* Convention Issue—1954. *Pulp and Paper Magazine of Canada*, v. 55, Convention Number, 1954, p. 127-272.

Covers C.P.P.A. meeting and the following technical articles: "Life Begins at Forty—Second Stadler Memorial Address", John S. Bates; "The Use of Starches as Aids in the Production of Papers Containing Minerals Fillers", Merchant L. Cushing; "Report on a Lubrication Survey in a Large Paper Mill", T. M. Medzwiecki; "Sveen Glue", Richard Tutt, Jr.; "Chlorine Dioxide Pulping of Jack Pine and Black Spruce Chips", F. G. Hurtubise; "Refining of Mill Wastes for Newsprint", R. T. Wetmore; "Comparison of British and American Board Mill Operations", John C. Alford; "Metallizing Unlimited in Pulp and Paper Mills", L. W. Darlington; "Recent Lignin Research in Sweden", Bengt Leopold; "Sodium Aluminate Non-Fibrous Raw Material", Harvey B. Berg; "Mannogalactan Additives in Paper", R. D. McCarron; "Some Effect of Gases on Properties of Fibre Suspension", Gunnar Gavelin; "Paper Mill Noise Problems", M. N. Davis and R. H. Caston; "A Study of the Problem of the Design of Ceramic Lined Digesters", F. M. Kraus; "What's Wrong With the Design and Operation of Wood Handling in Mill Yards", C. H. Mikkelborg; "Screening With the Vobrotor", Sven Fahlgren; "Application of Statistical Quality Control to Process Operations at Manitoba Paper Company", D. O. White and E. C. Metherell; "Investigation of Comfort Conditons in Newsprint Paper Machine Rooms", H. W. Rogers; "Report on Closed Hood Installations at Iroquois Falls", J. C. Jordan; "Performance Testing the Dryer Section of a Paper Machine", G. J. Chalmers; "Colloid Chemistry Applied to Board Making", W. H. Birchard; "Experience With Liquid Sulphur Dioxide in Acid Making", R. D. Litchfield; "Effect of Pipe Fitting on Flow of Fluids", V. W. G. Wilson; "Neutral Sulphite Cooking of Hardwoods", R. M. Dorland, R. A. Leask, and J. W. McKinney; and "Flocculation in Flowing Pulp Suspension", A. A. Robertson and S. G. Mason.

9043* The Pulp and Paper Industry of the Province of Quebec. Paul E. Lachance. *Pulp and Paper Magazine of Canada*, v. 55, Convention Number, 1954, 28 p.

Study of the industry in relation to its present and future wood supplies. Graphs, tables, maps, diagram. 30 ref.

9044* New Zealand Inaugrates Its First Integrated Pulp and Paper Mill. John Cardew. *Pulp and Paper Magazine of Canada*, v. 55, Feb. 1954, p. 44-48.

Raw materials, equipment, plant layout, and processing techniques. Photographs.

9045* Comparison of Wood Pulping Processes. Ralph H. McKee. *Pulp and Paper Magazine of Canada*, v. 55, Feb. 1954, p. 64-66.

Modern sulfate and McKee hydrotropic processes are compared in principle and procedure.

9046* The Removal of Lining and Carbohydrates During Bleaching of Semichemical Pulps. Karl J. Bjorkvist, Sune Gustafsson, and Leif Jorgensen. *Pulp and Paper Magazine of Canada*, v. 55, Feb. 1954, p. 68-72.

Some details of general interest in bleaching of neutral sulphite pulps. Tables, graphs. 11 ref.

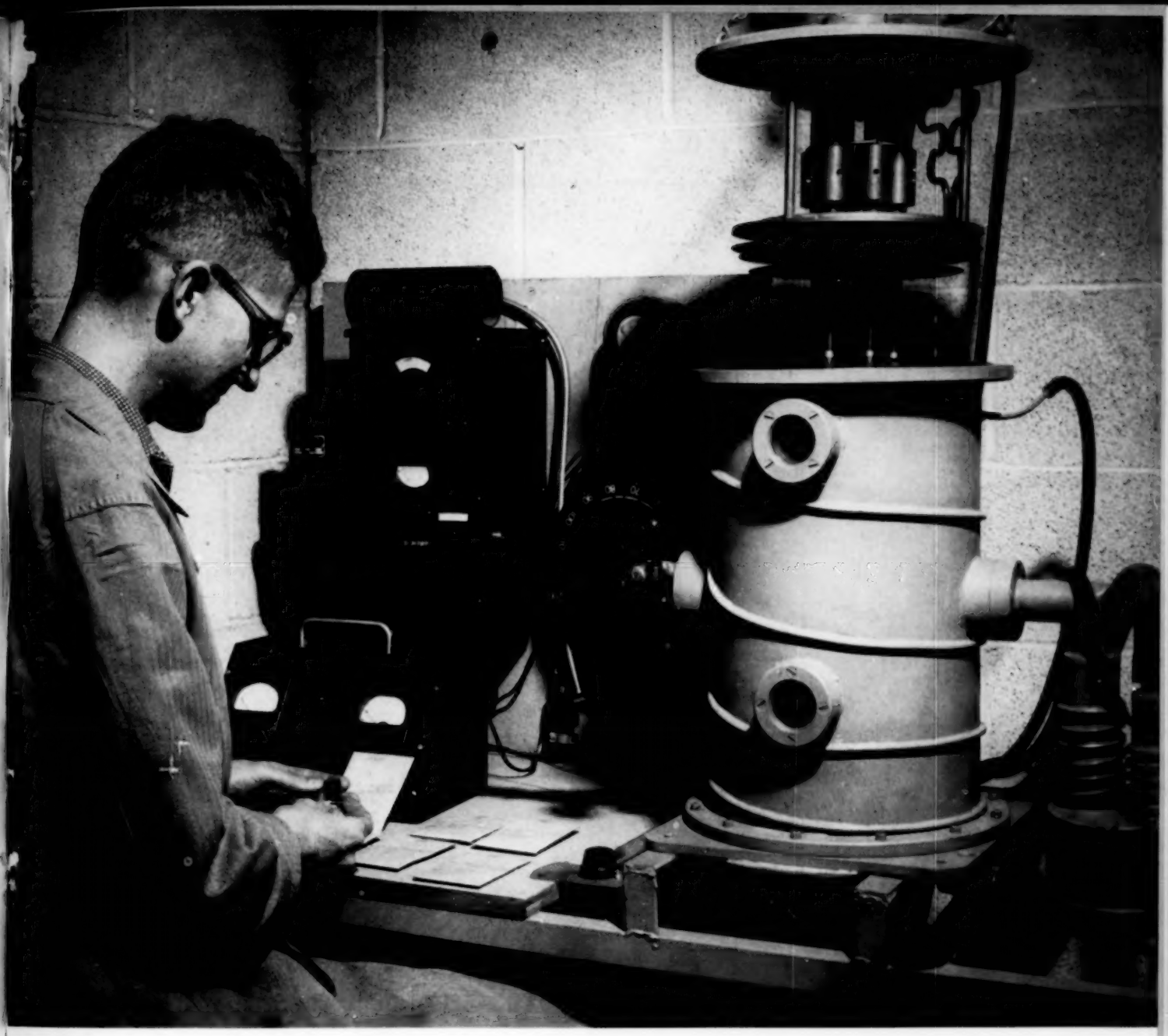
9047* Forest Biology Laboratory, Fredericton, N.B. Canada. *Pulp and Paper Magazine of Canada*, v. 55, Feb. 1954, p. 76-78, 80, 82-83.

Main objectives of research determine species of insects, fungi, and other plant and animal life concerned; work out their biology and relationships to forest environment; and discover how damage can be prevented or controlled. Photographs, map.

9048* Wood Treating by the Vacuum Process. James S. Bradshaw. *Southern Lumberman*, v. 188, Mar. 1, 1954, p. 32-34.

Operation of Dri-Vac method for applying preservatives. Photographs, diagram.

See also:
8019 (papermaking production statistics)
8959 (stress-strain curves of fibrous materials)



HOT-HARDNESS MACHINE

Because many alloys are designed to carry loads at elevated temperatures, metallurgists need equipment to help them estimate the strength of alloys at those temperatures. The hot-hardness machine shown here was built at Battelle to check metallurgical specimens for Vickers hardness at temperatures up to 900 C. Data provided by the machine may be used to estimate the short-time strength of alloys at elevated temperatures and to predict their hot-rolling, annealing, and age-hardening characteristics.

BATTELLE INSTITUTE was founded by the will of Gordon Battelle as a memorial to the Battelle family. The Battelles were among the first settlers of Ohio and were prominent in the development of the state's iron and steel industry.

Gordon Battelle, last of the family line, was impressed with the benefits to be derived from industrial research and left his estate for the building and endowment of an Institute "for the purpose of education . . . the encouragement of research . . . and the making of discoveries and inventions for industry." The Institute began operations in 1929.

As established, Battelle provides, on a not-for-profit basis, the physical plant, equipment, and personnel for conducting research. The great bulk of it is applied research conducted for industry and government.

In keeping with its educational function, the Institute also conducts fundamental or basic research. The results of much of this research are published for the general encouragement of science and industry, and to benefit the public welfare.

Fields of research at Battelle include agriculture and practically all the industrial and engineering sciences.

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